Marine Review

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THE BUSINESS OF TRANSPORTATION BY WATER

NEW YORK CLEVELAND LONDON

Published Monthly
Vol. 56, No. 4

APRIL, 1926

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Your Guide To this Issue

Shipbuilding

SHIPBUILDING is a true index of a nation's trend in shipping. New construction in American yards during 1925 shows the types of vessels and services for which there is an economic demand.

See Page 12

Intended Services

NOT a single new ship intended primarily for the foreign trade has been laid down. To maintain such foreign services as now exist replacements for obsolescent units must be made.

See Page 13

Distinctive Ships

TWENTY-SEVEN vessels ranging in type from de-luxe ocean liners to inland river boats are separately illustrated and described. An accurate visual cross-section of our shipbuilding, just as it is.

See Pages 14-62

Vessels Listed

ALL principal, steel, powered merchant vessels under construction in 1925 are listed, with their names, builders, owners and major particulars.

See Pages 56-57

Low Water

THE low cost of transportation of bulk cargoes on the Great Lakes has been a big factor in the welfare of a large section. Water must not be diverted from this system.

See Page 66

Pier Pays Well

A MODERN pier, built as the result of a strong community co-operative spirit, turned out to be of direct benefit to the state and to the city of Portland, Me.

See Page 69

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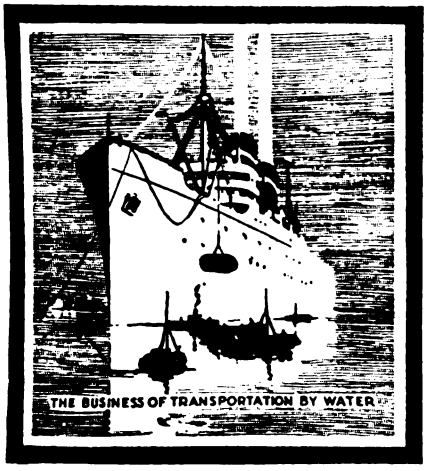
Marine Review

The National Publication Covering the Business of Transportation by Water

FOUNDED 1878



Published monthly by
The Penton Publishing Co.,
Cleveland, Ohio, U. S. A.

Cleveland Office, Penton Bldg.
H. Cole Estep, *Vice President*
A. H. Jansson, *Editor*
J. D. Pease, *Advertising Director*
F. V. Cole, *Circulation Manager*
H. N. Pickett
H. O. Taylor

Boston Office, 1037 Old South Bldg.
H. R. Simonds

Chicago Office, 1147 Peoples Gas Bldg.
E. C. Barringer

New York Office, 220 Broadway,
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London Office, 2-3 Caxton House,
Westminster, S. W. 1
Vincent Delport

Subscription United States and its possessions, $3 per year; Canada $4.00; Great Britain and other Foreign Countries, £1:0:0. Single copies 35 cents. Back numbers over three months 50 cents. The Cleveland News Co. supplies the trade with MARINE REVIEW through the regular channels of the American News Co. European Agent, The International News Co., Breams building, Chancery Lane, London, E. C., England.

Member, the Audit Bureau of Circulations, Associated Business Papers, Inc. and the National Publishers Association. Entered at the Post Office at Cleveland, Ohio, as Second Class Matter, under the act of March 3, 1879.

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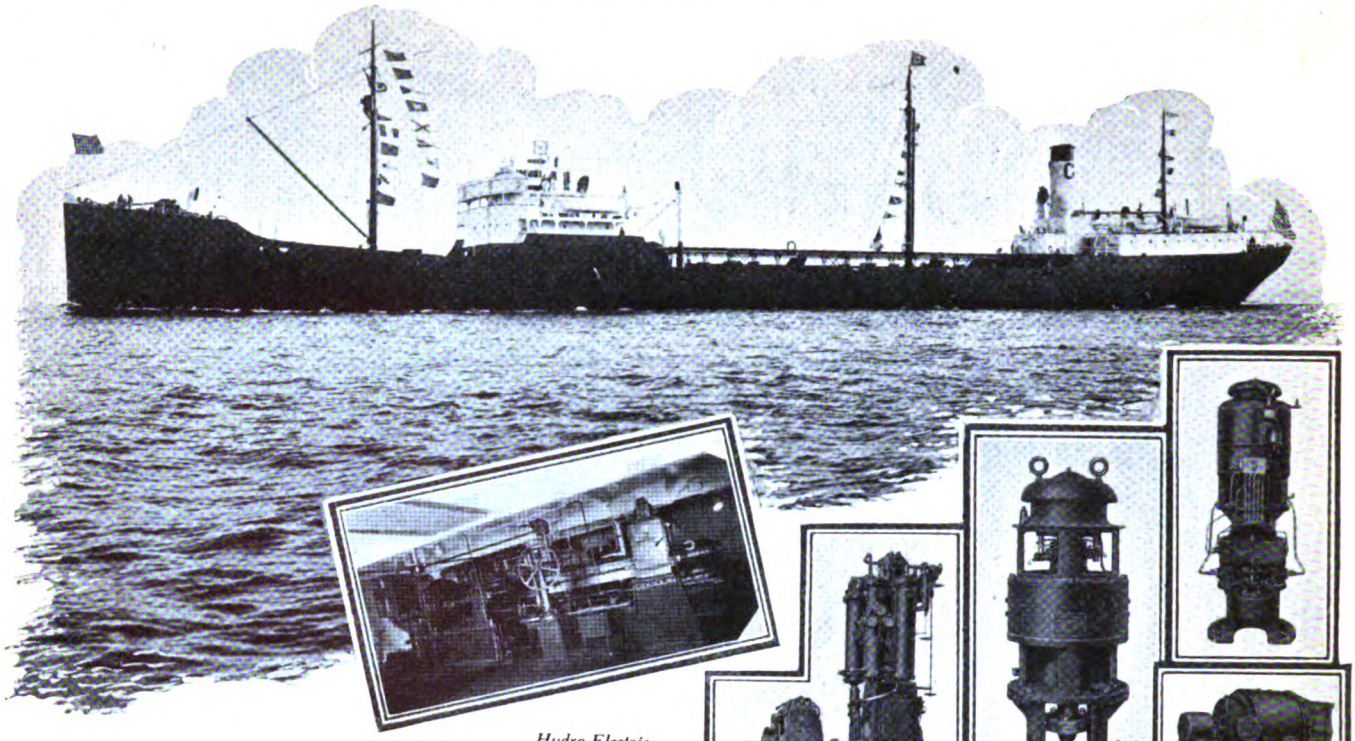
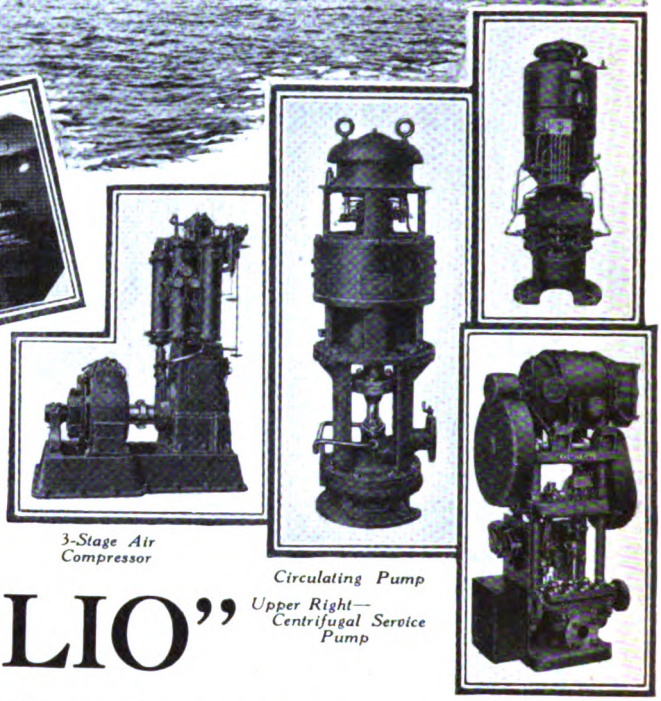


Hydro-Electric Steering Gear



3-Stage Air Compressor

Circulating Pump

Upper Right—Centrifugal Service Pump

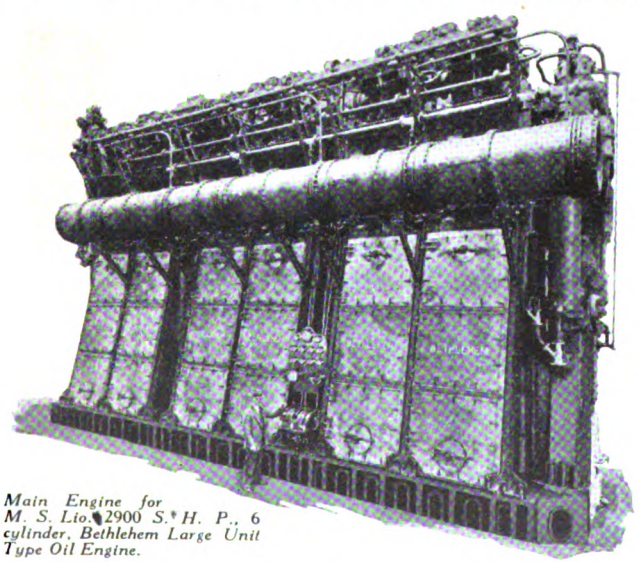
Reciprocating Pump

Conversion *of the* Tanker "LIO"

Reduces Fuel Consumption *122 Barrels per Day*

THE Motor Tanker LIO, 10,500 Deadweight Tons, owned by the General Petroleum Corporation, has shown during the first few weeks of service on the Pacific Coast a saving of 122 barrels of oil per day as compared with her fuel consumption when operated as an oil burning steam-driven vessel.

The complete conversion of the LIO was carried out at our Union Plant, San Francisco. The main engine and three Diesel oil engines for auxiliary drive are of Bethlehem manufacture, as well as almost all of the electric-driven auxiliaries.



Main Engine for M. S. Lio, 2900 S. H. P., 6 cylinder, Bethlehem Large Unit Type Oil Engine.

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Motor-Driven Vertical Centrifugal Sanitary Pump
Motor-Driven Vertical Centrifugal Fresh Water Pump
Motor-Driven Vertical Reciprocating Oil Transfer Pump
Motor-Driven Vertical Reciprocating Boiler Feed Pump
Motor-Driven Vertical 3-Stage Auxiliary Starting Air Compressor
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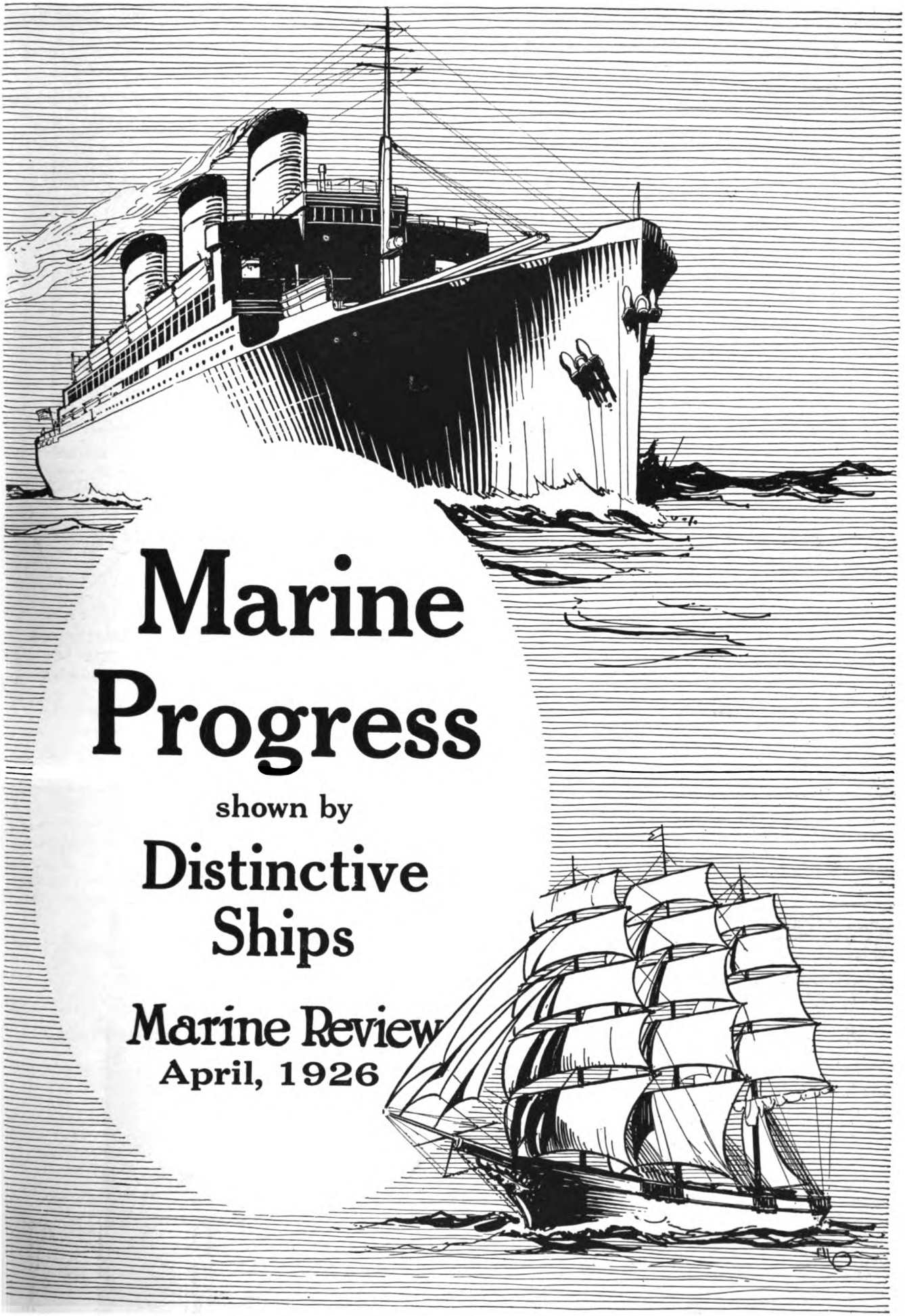

Marine Progress

shown by

Distinctive Ships

Marine Review
April, 1926

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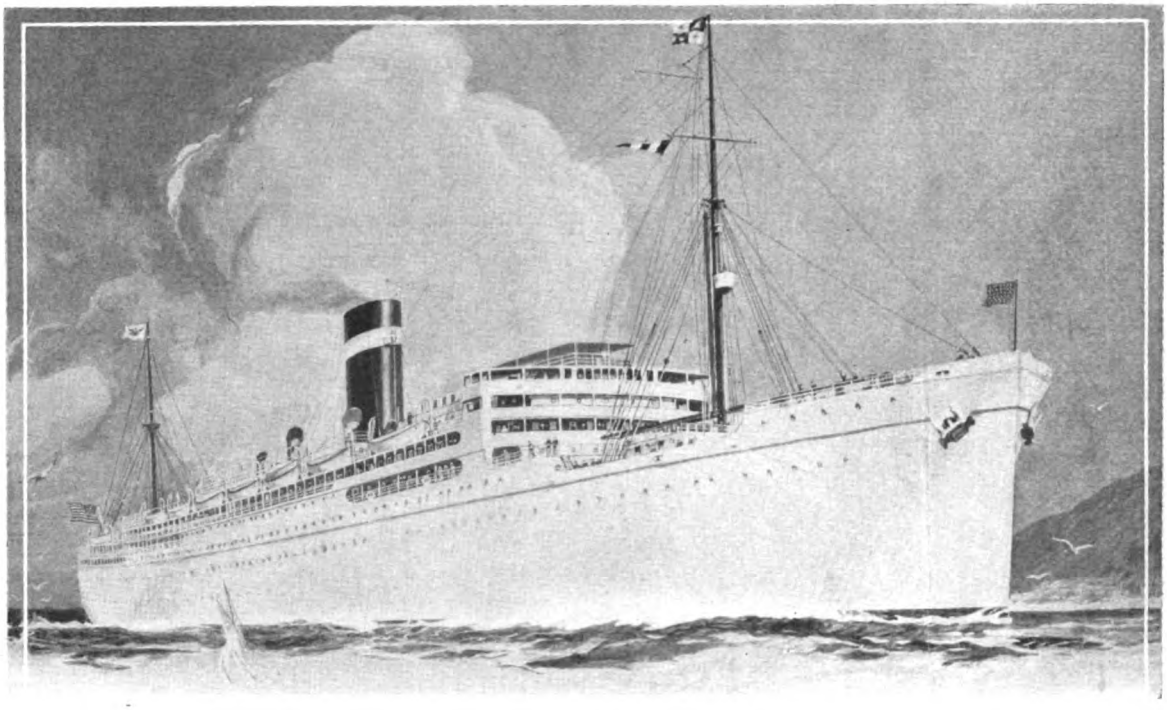

Shipbuilding in U. S. Improves

Over 100 Steel Powered Merchant Vessels Under Construction in 1925—Authoritative Record Is Given—Distinctive Ships Are Featured

THE potentialities of the United States as a maritime nation, in the expansion of its own domestic commerce and the increased use of its bordering seas, navigable inland waterways and lakes, are but vaguely appreciated. During 1924, American vessels to the number of 250 entered and 218 cleared at ports of the Philippine Islands. Cargo tonnage transiting the Panama canal in American bottoms during 1925 totaled more than 12,000,000 tons. Trade with the Hawaiian Islands has increased beyond all original expectations. On the Great Lakes during 1925, 113,370,707 short tons of ore, coal, grain and stone were carried by water to say nothing of the package and passenger trade. Coastwise traffic is greater than ever before and in all of these trades the growth of passenger travel has kept pace or exceeded the increase in freight. And this is but a beginning. Nothing short of a blight on our national spirit can stop it.

Shipbuilding in the United States reflects this condition. Small as it may seem in the aggregate the fact remains that not including many lesser vessels, the United States held third rank in 1924, and in 1925, fourth rank among all the nations of the world, and this without building a single ship either year exclusively for the foreign trade. But there are legitimate and well founded hopes that American ships engaged in the foreign trade will steadily increase in number. The handicaps of greater cost of operation can and will be overcome by a wise governmental policy and an ever growing experience on the part of American business men and ship operators in commerce and trade with other nations.

To study the status of our present shipbuilding and its vital significance to the merchant marine a thorough and complete

Motive Power Compared—Two Years

Types	No.		Pct.	
	1924	1925	1924	1925
Steam reciprocating coal burner	30	36	29.7	33.7
Steam reciprocating oil burner	28	20	27.7	18.7
Steam turbine oil burner	10	14	9.9	13.1
Diesel engine, direct drive	21	21	20.8	19.6
Diesel engine, electric drive	11	12	10.9	11.2
Turbine-electric oil burner	0	3	0.0	2.8
Turbine-electric coal burner	1	1	1.0	0.9
Totals	**101**	**107**	**100.0**	**100.0**

Recapitulating for Primary Power

Types	No.		Pct.	
	1924	1925	1924	1925
Steam—as primary power	69	74	68.3	69.2
Diesel—as primary power	32	33	31.7	30.8
Totals	**101**	**107**	**100.0**	**100.0**

Recapitulating for Power at Propeller

Types	No.		Pct.	
	1924	1925	1924	1925
Steam—Direct and reduction gears	68	70	67.3	65.5
Diesel—Direct drive	21	21	20.8	19.6
Electric—Diesel and steam	12	16	11.9	14.9
Totals	**101**	**107**	**100.0**	**100.0**

Recapitulating for Fuel

	1924	1925	1924	1925
Steam—Burning Coal	31	37	30.7	34.6
Steam—Burning Fuel Oil	38	37	37.6	34.6
Diesel—Diesel oil as fuel	32	33	31.7	30.8
Totals	**101**	**107**	**100.0**	**100.0**

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survey has been made of merchant steel powered vessels over 100 gross tons, completed, under construction or contracted for in American shipyards from Jan. 1, 1925 to Jan. 1, 1926. As a result of this study there is listed on pages 56 and 57, 107 vessels falling within this category with their names or hull numbers and principal characteristics and intended service. From among this number 27 vessels representing through duplication 46 in all have been selected as distinctive or typical. Each one of these 27 is especially illustrated and described in detail in the following pages from 14 to 62. These pages give a graphic portrayal of the range of American shipbuilding. Among these distinctive ships will be found the magnificent new vessel now well underway for the San Francisco to Hawaii run; a modern twin screw sea-going passenger vessel 582 feet long of 17,200 gross tons, fitted with geared turbines of a total shaft horsepower of 25,000, and capable of a speed of 21½ knots. During this period there was also ordered an equally elaborate ocean going passenger ship to be fitted with turbo-electric drive for the service from New York to San Francisco. Compare these ocean liners, though built purely for domestic needs, with the typical inland river stern wheel shallow draft steel hull towboat in which the power is furnished by a single compound reciprocating engine, steam for which is supplied by a river boat type of boiler burning coal. In the accompanying box, page 12, types of power in the ships under construction are compared for the years 1924 and 1925. It will be noted that the number and percentage of reciprocating engined coal burning vessels have increased over 1924 and that this class still represents over a third of the entire number of vessels under consideration in this survey. But if all steam reciprocating engined vessels, coal and oil burners, are grouped together it is clear that both in actual numbers and percentage there has been a slight drop, though this classification still represents over 50 per cent of all vessels listed. A marked increase is shown both actually and in percentage for vessels fitted with turbine reduction gear main drives and boilers burning oil. Diesel engine direct drives are equal in number and show a slight drop in percentage. Diesel-electric has not only maintained its own but increased slightly.

One of the most interesting developments is in the application of the steam turbine-electric drive. Four out of the 107 vessels studied either are or will be fitted with turbo-generators and electric

(*Continued on Page* 94)

Analysis of American Merchant Shipbuilding—1925

Types of Vessels	No.	Recip. Coal	Recip. Oil	Turb. Oil	Diesel Oil	Die.Elec Oil	Tur.Elec Oil	Tur.Elec. Coal
Passenger—Ocean	2			1			1	
Passenger—Coastwise	12			12				
Passenger—Sound	6	4	2					
Passenger—Rivers	1	1						
Freighter—Ocean	2			1	1			
Freighter—Lakes	11	8			1	1		1
Freighter—Bay, Rivers	1		1					
Tanker—Ocean	2				2			
Tanker—Bay, Rivers	5				3	2		
Ferry—Harbors	20	5	15					
Ferry—Lakes	2	1			1			
Ferry—Bay, Rivers	10	6	1		2		2	
Carferry—Lakes	2	2						
Towboat—Harbors	4	2				2		
Towboat—Rivers	16	7			6	3		
Dredge—Harbors	5				2	3		
Special—Harbors	5		1		3	1		
Special—Bay, Rivers	1	1						
TOTALS	107	36	20	14	21	12	3	1

Distinctive Ships--Where to Find Them

Passenger Ships

Name and Service	*Page*
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Ferries (contd.)

Name and Service	*Page*
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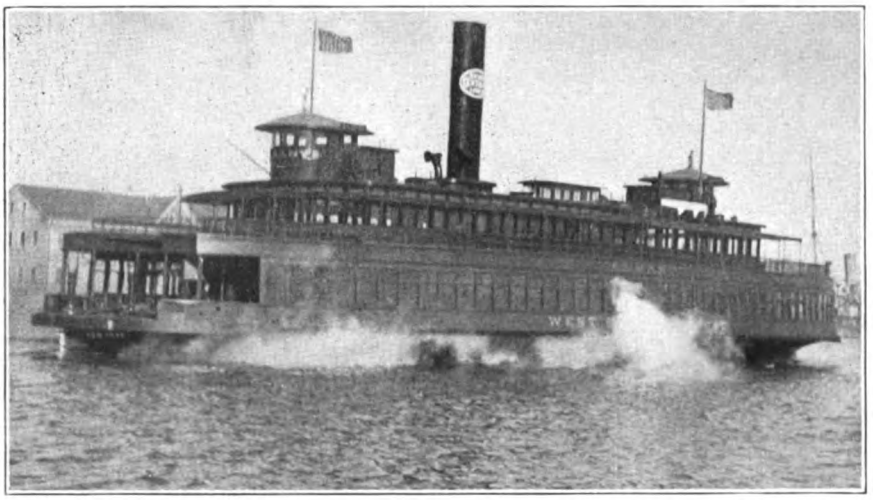
ALBANY—Ferry—Double Ended—Screw Steamer



DESCRIPTION

The ferryboat ALBANY designed by J. W. Millard & Bro., for the New York Central railroad, and built by the Staten Island Shipbuilding Co., represents the latest refinements in ferries for the great rail lines which serve Manhattan. The usual type of steam motive power is used, but with oil as fuel.

Name—ALBANY.
Owner—New York Central railroad.
Builder—Staten Island Shipbuilding Co.
Naval Architect—J. W. Millard & Bro.
Launched—Sept. 8, 1925.
Completed—Nov. 16, 1925.

HULL PARTICULARS

Length overall, 210 feet; length between perpendiculars, 180 feet; water line breadth molded, 38 feet 6 inches; deck breadth molded, 45 feet; depth molded, 17 feet 6 inches; draft loaded, 10 feet 3 inches; displacement loaded, 1280 tons; gross tonnage, 1389; net tonnage, 944; passenger capacity, 2000; cargo capacity, 130 tons of vehicles; bunker fuel capacity in tons of oil, 45; speed, 15 miles per hour.

MACHINERY PARTICULARS

Main Engines—Two, 2-cylinder compound reciprocating steam engines built by W. & A. Fletcher Co.; size. 19 x 38 inches and 28-inch stroke.

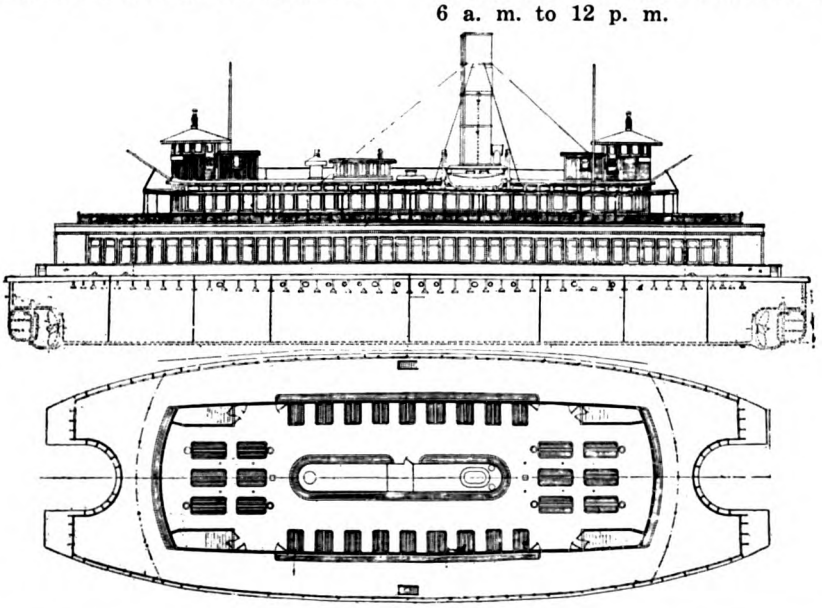
Boilers—Two single end, Scotch type; name of maker, Staten Island Shipbuilding Co.; size, 13 feet in diameter by 13 feet long; working pressure, 150 pounds per square inch; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Worthington Pump & Mach. Corp.
Steering Engine—American Engineering Co.
Propellers—Staten Island Shipbuilding Co.
Oil Burning Equipment—Todd Shipyards Corp.
Electric Generators—General Electric Co.
Feed Water Heaters—Davis Eng. Corp.
Plywood—Haskelite Mfg. Co.

The ferryboat ALBANY is to be used in the run from Weehawken on the New Jersey side of the Hudson river to the New York side at Forty-second street, and to Cortland street. Railroad ferry boats on the Forty-second street service are run under 7 minutes' headway from 6 a. m. to 12 p. m.



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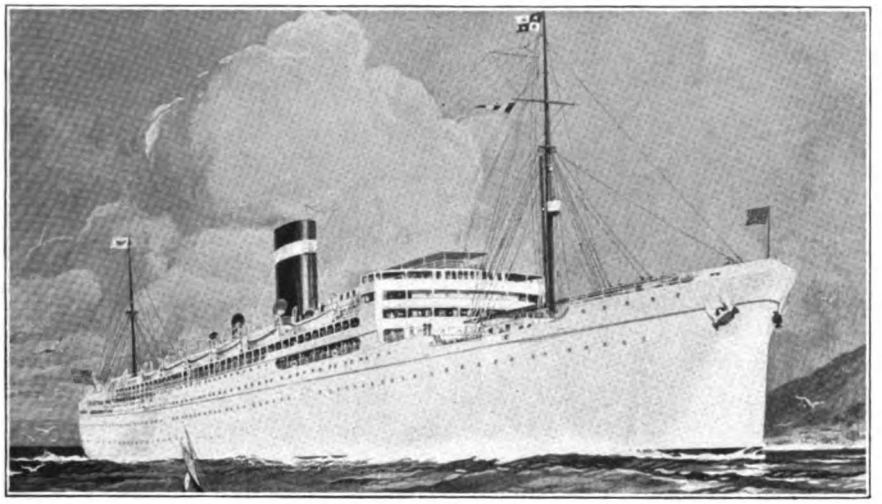
HULL NO. 315—Passenger Ocean Liner-Twin Screw Electric



DESCRIPTION

The smart looking new ship pictured here is now under construction and will be completed in the fall of 1927 for service between New York and California. In every respect this liner will be comparable to the finest transatlantic ships now in service. She will be fitted with turbo-electric drive and will make a speed of 18 knots.

Name—Hull No. 315
Owner—Panama Pacific Line (I. M. M. Co.)
Builder—Newport News S. & D. D. Co.
Launched—Under construction
Classification—American Bureau of Shipping

HULL PARTICULARS

Length overall, 601 feet 3 inches; breadth molded, 80 feet; depth molded, 52 feet; draft, 32 feet 3 inches; displacement loaded, 31,000 tons; gross register tonnage, approximately 22,000; passenger capacity, first class, 362; intermediate class, 360; cargo capacity, 7800 tons; bunker fuel oil capacity in tons, 5000; speed, 18 knots average.

MACHINERY PARTICULARS

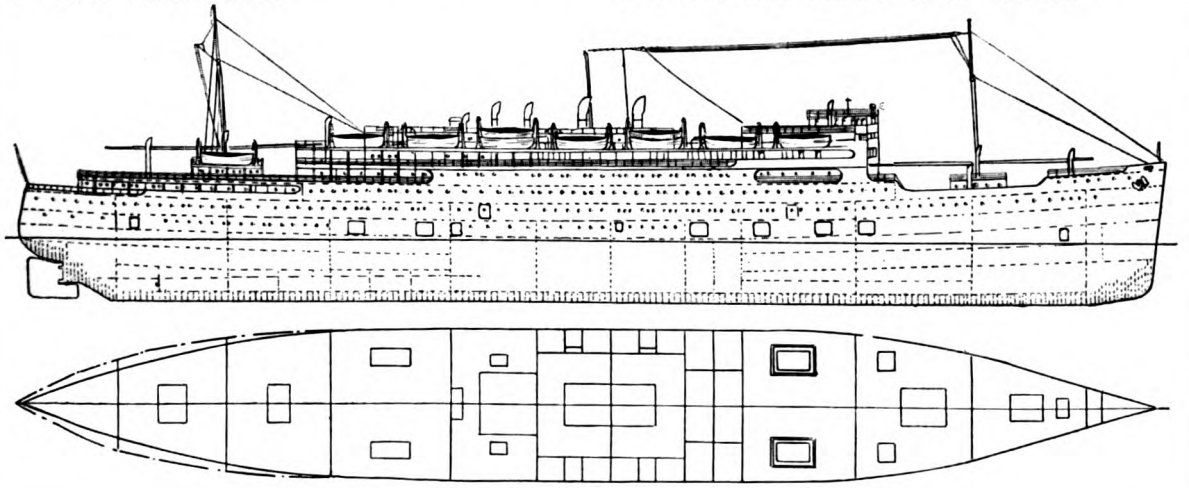
Main Engine—Turbo electric propulsive machinery to be supplied by the General Electric Co.; a twin screw installation with a total of 17,000 shaft horsepower at 120 revolutions per minute of the propellers. There will be one main generator and two D. C. propulsive motors, each direct-connected to a propeller. These electric motors will be double armature and will be 8500 shaft horsepower each at 120 revolutions per minute.

Boilers—Twelve Babcock & Wilcox marine water tube boilers of a total heating surface of 55,764 square feet and 11,160 square feet of superheating surface; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington Mach. Corp.
Gyro Compass and Gyro Pilot—Sperry
Searchlight—Sperry Gyroscope Co.
Vehisote—The Pantasote Co., Inc.
Aux. Lighting—Diehl Mfg. Co.
Oil Burning Equipment—Babcock & Wilcox
Much of the equipment still to be settled on.

In general design as well as in many details of plan and construction the new liner will differ from any other vessel now employed in the American coastal or intercoastal trades. Her design is based on the new "Minne" class liners of the Atlantic Transport line, the MINNEWASKA and MINNETONKA plying between New York and London. She will be much more elaborate as to deck plans and cabin arrangement to meet the peculiarly exacting requirements of service in both tropical and temporate climates at all seasons.



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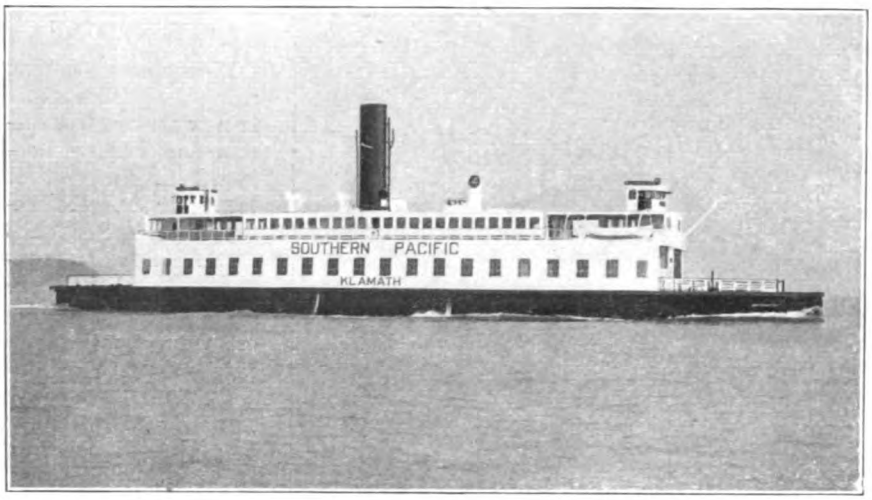
KLAMATH—Ferry—Double Ended—Screw Steamer



DESCRIPTION

A steel hull, double ended, screw ferry steamer for the Richmond & San Francisco Transportation Co. Used in transporting automobiles and passengers on San Francisco bay. Machinery is of conservative type, consisting of one reciprocating steam engine and three water tube boilers equipped to burn oil.

Name—KLAMATH.
Owner—Southern Pacific Co.
Builder—Bethlehem S. B. Corp., Union Plant.
Naval Architect—E. P. McRitchie.
Launched—Dec. 27, 1924.
Completed—Jan. 26, 1925. The sister ferryboat NEW ORLEANS was launched Dec. 10, 1924 and completed Jan. 2, 1925. Both of these vessels are sister ships of the EL PASO completed Dec. 8, 1924.

HULL PARTICULARS

Length overall, 246 feet; length between perpendiculars, 234 feet; breadth molded of hull, 44 feet 8⅜ inches, and over guards 63 feet 6 inches; depth molded, 19 feet 2½ inches; draft, 12 feet 4 inches; displacement loaded, 1340 tons; gross tonnage, 1953; net tonnage, 925; passenger capacity, 1000; cargo capacity, 80 automobiles; bunker fuel capacity, 62 tons; speed on trials, 13 knots.

MACHINERY PARTICULARS

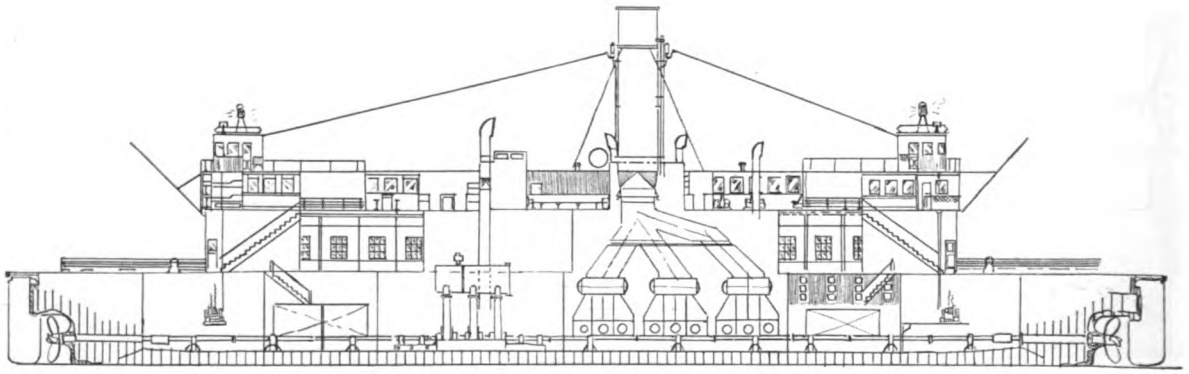
Main Engine—One vertical inverted triple expansion steam engine built by Buckeye Engine Co.; size, 19 x 32 x 56 inches and 36 inches stroke.

Boilers—Three water tube built by Traylor Engine & Mfg. Co., heating surface for each boiler 2518 square feet; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Warren Steam Pump Co. and Dean
Steering Engine—Bethlehem S. B. Corp.
Propellers—Beth. S. B. Corp., Union Plant.
Oil Burning Equip.—Bethlehem S. B. Corp.
Elec. Gen.—Westinghouse, B. F. Sturtevant.
Feed Water Heaters—Davis Eng. Corp.

The hull to the main deck is built entirely of steel on the transverse system of framing and is subdivided into eight watertight compartments making the vessel safe if one section should be flooded. Over the engine and boiler spaces the main deck is completely plated and elsewhere it is covered with stringers and tie plates. A calked wood deck is laid on top with transversely laid sheathing spiked to planking. The sides of the superstructure housing the automobiles is built of steel with bulb angle frames and three steel webs to prevent racking. Beams supporting the saloon deck and the engine and boiler space casing are of steel. On the saloon deck is fitted a wooden house containing the restaurant, galley, smoking room, ladies' room, main cabin and lavatories. The captain's quarters are located on each end of this deck. Pilot houses are located on top of the saloon deck house.



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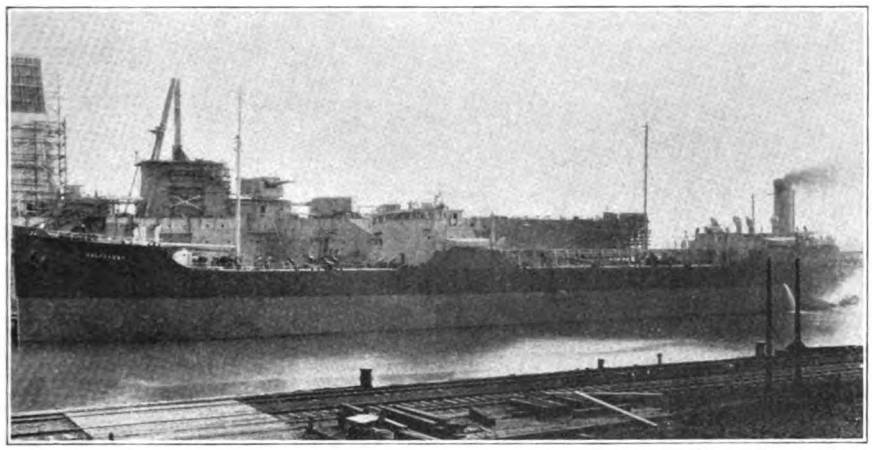
GULFCREST—Tanker—Twin Screw Diesel



Name—GULFCREST.
Owner—Gulf Refining Co.
Builder—New York Shipbuilding Corp.
Naval Architect—E. H. Rigg
Launched—March 1, 1926
Completed—Under construction
Classification—Lloyds + 100 A-1 and American Bureau of Shipping A-1E.

HULL PARTICULARS

Length over all, 479 feet 3 inches; length between perpendiculars, 460 feet; breadth molded, 65 feet; depth molded, 38 feet 4 inches; draft, 28 feet 4-51/6 inches; displacement loaded, 19,485 tons; gross tonnage, estimated, 9500; net tonnage estimated, 6000; cargo capacity, 12,660 tons; cargo capacity cubic feet, 568,000; bunker fuel capacity in tons, 900; speed, 11½ knots.

MACHINERY PARTICULARS

Main Engines—Two diesel, New Work Werkspoor type, each 6-cylinder 27-inch diameter x 47-inch stroke, built by New York Shipbuilding Corp.

Boilers—Two single ended Scotch type; size, 12 feet 6 inches in diameter x 11 feet long, built by New York Shipbuilding Corp.; fuel, oil or exhaust gas. Two auxiliary oil engines, 3-cylinder, 11 x 15 inches, built by Rathburn-Jones, furnish ample auxiliary power.

DESCRIPTION

This twin screw diesel tanker represents the latest and best American practice in tanker shipbuilding. She is the largest ship built in the United States up to the present time, fitted with diesel engines. The planning and workmanship on this vessel have been of the highest quality in every respect.

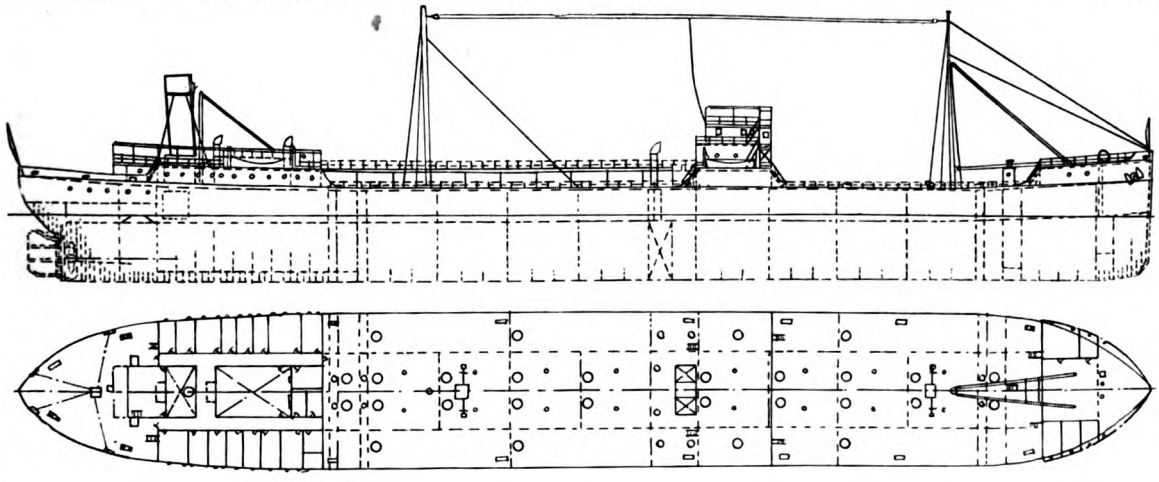
AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Worthington, Warren Steam Pump Co. & American Brown-Boveri Electric Corp.
Windlasses—Hyde Windlass Co.
Winches—Hyde Windlass Co.
Steering Engine—Hyde Windlass Co.
Propellers—American Brown-Boveri
Refrigeration—Brunswick-Kroeschell
Oil Burning Equipment—Todd, Babcock & Wilcox and Bethlehem
Electric Generators—General Electric Co.

The GULFCREST was planned and laid down by the New York Shipbuilding Corp in the spring and summer of 1925.

When the construction of this tanker had progressed to within a short period of the launching, the Gulf Refining Co. of New York entered into a contract with the American Brown-Boveri Electric Co. for the purchase of the vessel. That an experienced vessel-operating oil company should find after inspection that this vessel met their needs fully testifies to the quality of planning and workmanship which had gone into the building of the ship.



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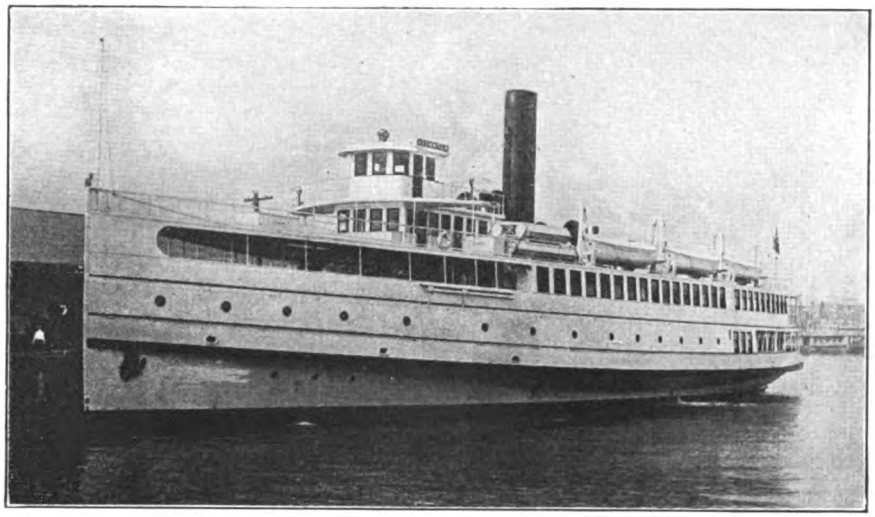
NOBSKA—Passenger—Single Screw Steamer



DESCRIPTION

This vessel is in all respects an exact duplicate of the steamer ISLANDER built at the same yard two years ago. The design to meet the requirements of day passenger service to Nantucket proved so satisfactory that no changes were necessary. She is a coal burner and has a speed of 14½ knots.

Name—NOBSKA.
Owner—New England Steamship Co.
Builder—Bath Iron Works, Bath, Me.
Naval Architect—New England Steamship Co., technical staff.
Launched—March 24, 1925.
Completed—March 31, 1925.
Classification—Owners' requirements.

HULL PARTICULARS

Length overall, 210 feet; length between perpendiculars, 202 feet; breadth over guards, 50 feet; depth molded, 14 feet 6 inches; beam molded, hull, 36 feet; draft, loaded, 9 feet 3 inches; displacement loaded, 882 tons; gross tonnage, 1089; net tonnage, 456; passenger capacity, winter 230, summer, 1960; cargo capacity, tons, 150; cargo capacity, cubic feet, 34,000; bunker fuel capacity in tons, 20; speed, 14½ knots.

MACHINERY PARTICULARS

Main Engine—Name of builder, Bath Iron Works; number 1; type, T. E., 4 cylinders; size, 16 x 26 x 30 x 30 and 24-inch stroke; indicated horsepower, 1200.

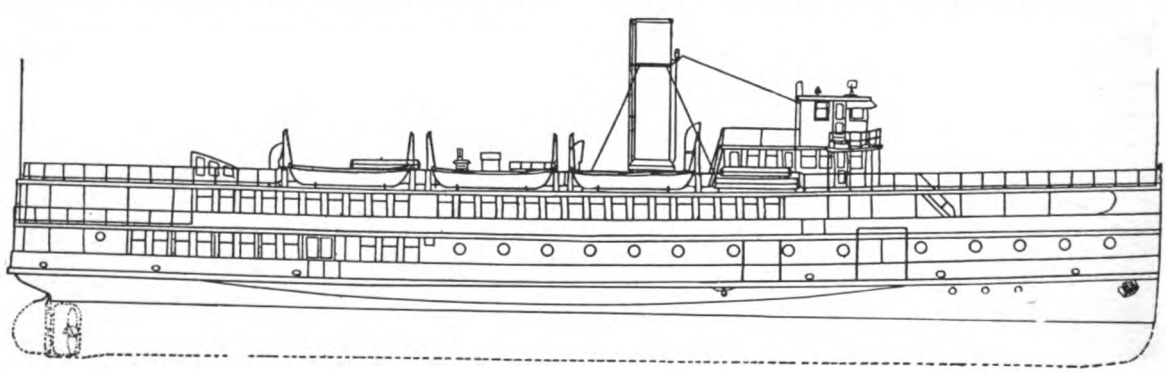
Boilers—Number 2; name of maker, Babcock & Wilcox Co.; type, water tube; size, 130 square feet grate surface; 4500 square feet heating surface; 16 Diamond Power Specialty Corp. blowers installed.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Worthington Pump & Machinery Corp. and Warren Steam Pump Co. (feed pumps).
Windlass—Hyde Windlass Co.
Capstan—Hyde Windlass Co.
Steering Engine—Hyde Windlass Co.
Propellers—Bath Iron Works.
Electric Generators—General Electric Co.

This vessel carries freight and passengers between New Bedford and the island of Nantucket. She is a day steamer with a number of state rooms which serve as retiring rooms and for rest. The experience of long service in this run has been followed in the design, to make this steamer an able sea-going vessel and to provide the maximum comfort and safety for passengers. A specialized boat with a pleasing appearance, sturdily and substantially built, the NOBSKA may be said to be one of the best of her kind and a credit to her designers and builders.



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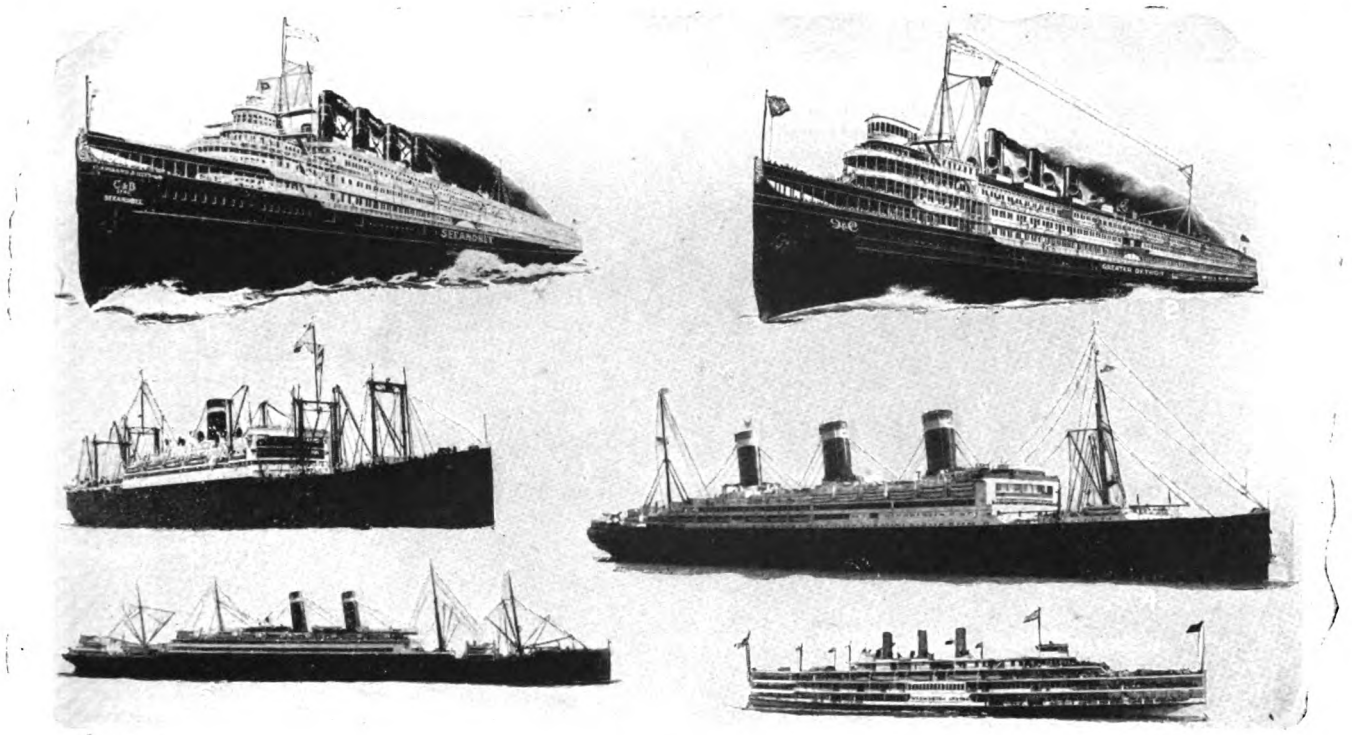

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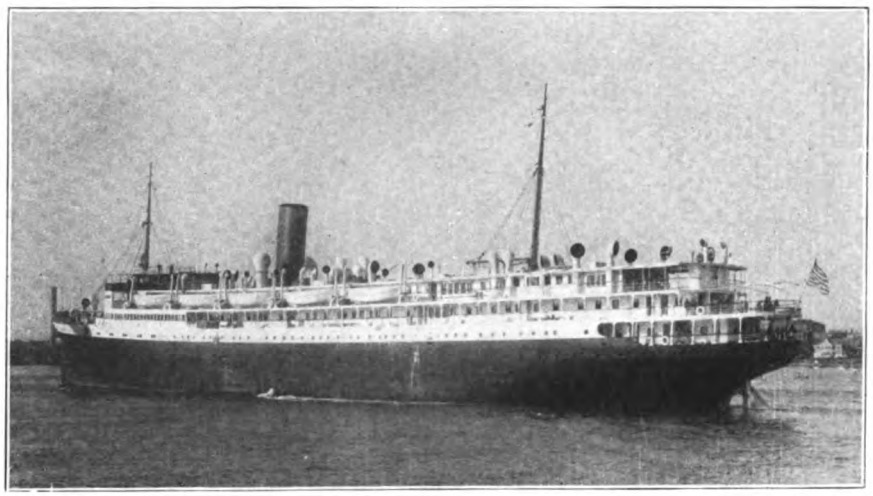
MOHAWK—Passenger—Coastwise—Single Screw Steam



Name—MOHAWK.
Owner—Clyde Steamship Line.
Builder—Newport News S. B. & D. D. Co.
Naval Architect—Theodore E. Ferris.
Launched—Oct. 21, 1925.
Completed—Feb. 1, 1926.
Sister Ships—CHEROKEE, launched Feb. 10, 1925, completed June 17, 1925 and SEMINOLE, launched April 14, 1925, completed Aug. 10, 1925.
Classification—American Bureau of Shipping.

HULL PARTICULARS

Length overall, 402 feet, length between perpendiculars, 387 feet 6 inches; breadth molded, 54 feet; depth molded to hurricane deck, 31 feet 6 inches; draft, 18 feet; displacement loaded, 7160 long tons; gross tonnage, 5300; net tonnage, 3950; passenger capacity. 369 first and 80 steerage; cargo capacity, 2600 long tons or 172,500 cubic feet; bunker fuel oil capacity, 1030 long tons; speed, 15 knots.

MACHINERY PARTICULARS

Main Engine—One, Curtis Brown geared steam turbine built by Newport News Shipbuilding & Drydock Co.; type, impulse; size, 4200 shaft horsepower.

Boilers—Four single ended, Scotch type, built by Newport News Shipbuilding & Drydock Co.; size, 16 feet inside diameter by 12 feet long; fuel, oil.

DESCRIPTION

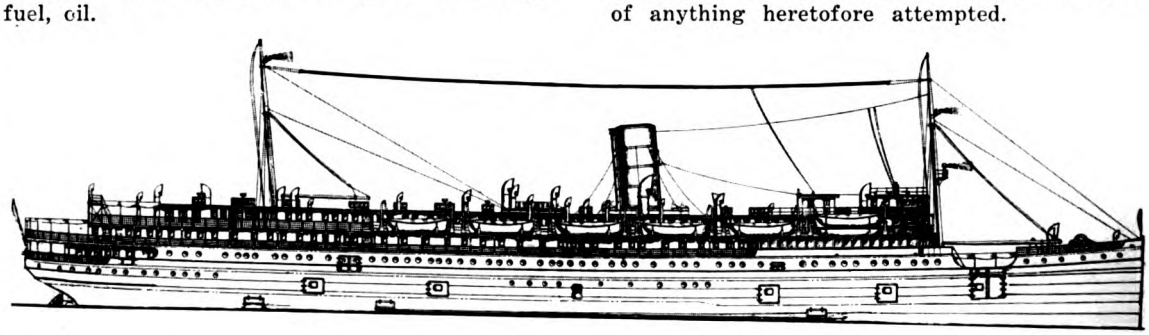
This fine ship is the last of three duplicate passenger and cargo vessels completed for the Clyde Steamship Line. These vessels are of the combination passenger and cargo coastwise type. All three are now in service between New York, Charleston and Jacksonville. Cargo handling facilities and passenger accommodations are exceptionally well worked out.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington.
Windlass—American Engineering Co. (electric)
Winches—Lidgerwood Mfg. Co., electric drive, by Westinghouse Elec. & Mfg. Co.
Steering Engine—American Engineering Co.
Propeller—Newport News S. B. & D. D. Co.
Radio Equip.—Independent Wireless Co.
Refrigeration—Brunswick-Kroeschell.
Oil Burning Equip.—Todd Shipyards Corp.
Electric Generators—Westinghouse Elec. & Mfg. Co., two 60 kilowatt and one 100 k. w.
Life Saving Equip.—Welin Davit & Boat Corp.
Electric Motors—Diehl Mfg. Co.
Evaporator—Griscom Russel Co.
Oil Heaters and Coolers—Griscom Russel Co.
Valves—The Crane Co.
Feed Water Heaters—Griscom Russel Co.
Vehisote—The Pantasote Co. Inc.
Deck Windows—Kearfott Eng. Co.

The freight decks are divided into water tight compartments, with side ports for quick handling of cargo. The holds and compartments are mechanically ventilated to insure fresh air and even temperatures at all seasons and in all climatic conditions for the protection and safe transportation of fruits, vegetables and other perishables. Facilities are also provided for the shipment of automobiles.

The passenger accommodations are in advance of anything heretofore attempted.



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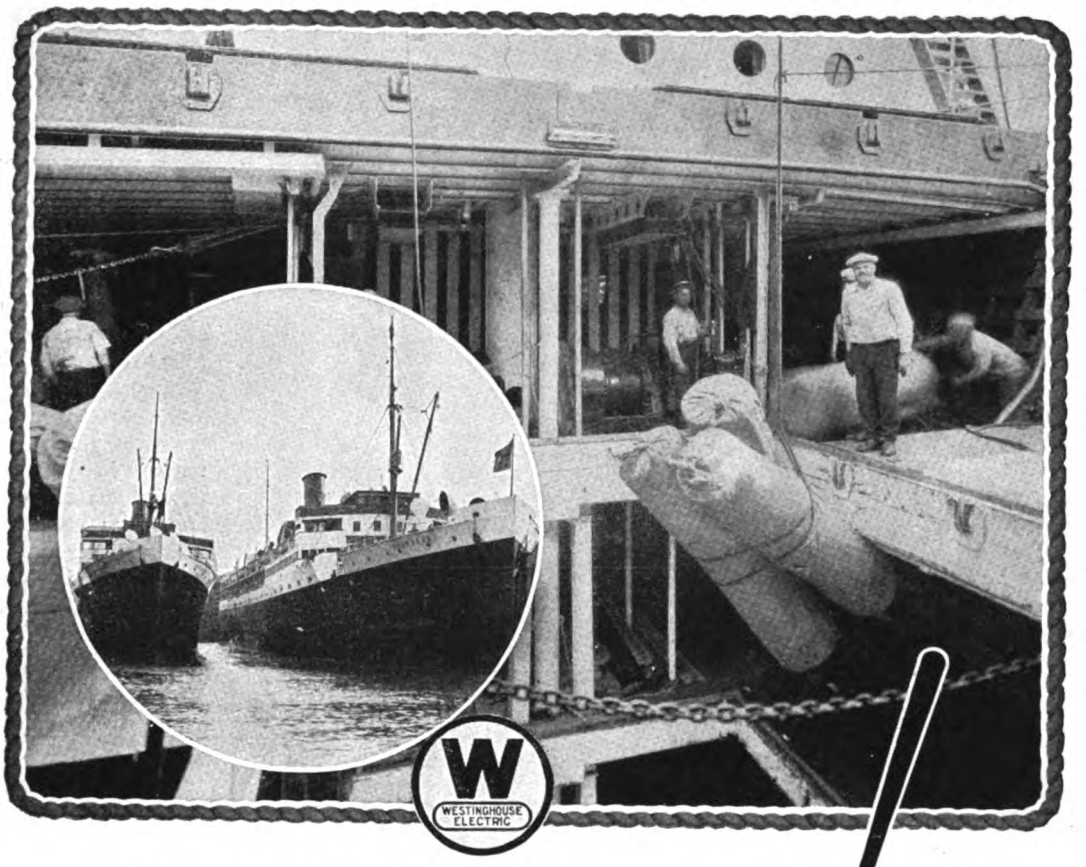

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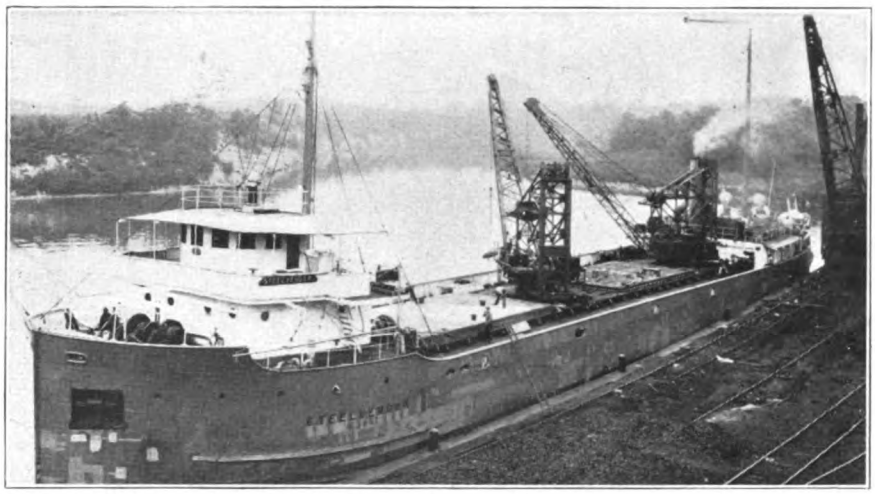
STEEL ELECTRICIAN—Freighter—Single Screw—Diesel-Electric



STEEL VENDOR—In hull and deck arrangements the STEEL ELECTRICIAN will be similar

DESCRIPTION

The STEEL ELECTRICIAN and her sister vessel STEEL CHEMIST in hull and cargo handling arrangements are practically duplicates of the STEEL MOTOR and STEEL VENDOR. A change however has been made in propulsive power. Diesel electric is to be fitted in the first of these, while a double acting diesel engine will be fitted in the other.

Name—STEEL ELECTRICIAN.
Owner—U. S. Steel Products Co.
Builder—Federal S. B. & D. D. Co.
Naval Architect—John C. Craven.
Launched—March 1926.
Completed—Under construction.
Class—American Bureau of Shipping.

HULL PARTICULARS

Length over all, 257 feet 7¾ inches; length between perpendiculars, 250 feet; breadth molded, 42 feet 9 inches; depth molded, 20 feet; draft, 14 feet; displacement loaded, 3525; gross tonnage, about 1700; net tonnage, about 975; deadweight capacity, 2075; cargo capacity cubic feet, 120,650; bunker fuel capacity in tons, 81; speed, 9 knots.

MACHINERY PARTICULARS

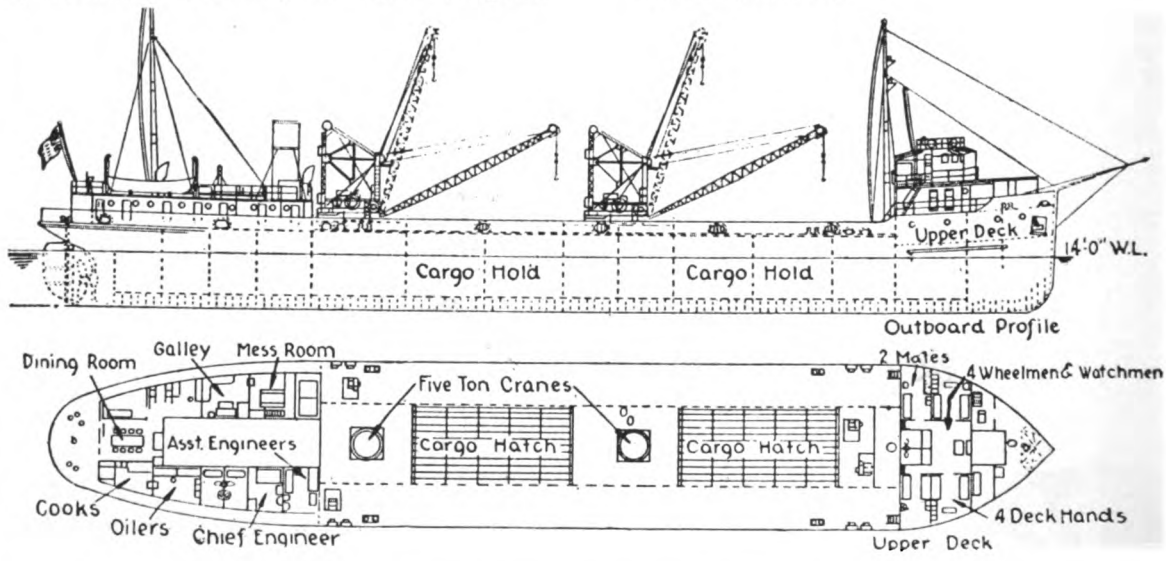
Main Engines—Three diesel engines, 4-cycle single acting 4-cylinder, 15 inches in diameter by 22 inches in stroke; 900 shaft horsepower total; built by New London Ship & Engine Co.

Boiler—One vertical fire tube boiler of 355 square feet heating surface; fuel, oil; built by Federal Shipbuilding & Drydock Co.

Main Generators—Three, 200 kilowatt each, Westinghouse; exciters, three, 30 kilowatt each; one D. C. motor, 750 shaft horsepower, Westinghouse.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington.
Windlasses—Hyde Windlass Co.
Winches—Hyde Windlass Co.
Steering Engine—Hyde Windlass Co.
Propellers—Federal S. B. & D. D. Co.
Refrigeration—Brunswick-Kroeschell.
Electric Generators—Westinghouse.
Contra propeller—Th. Goldschmidt Corp.
Elec. Motors—Diehl.
Valves—Crane Co.



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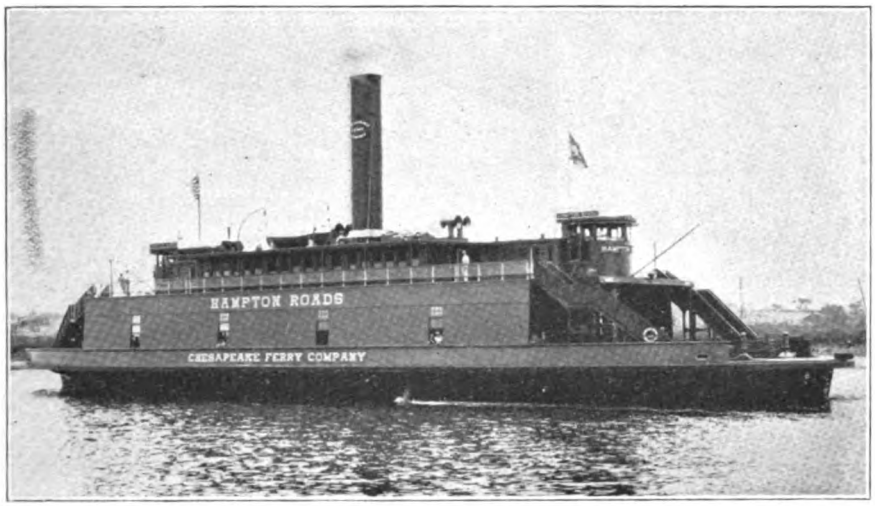
HAMPTON ROADS—Ferry—Double Ended—Steam



DESCRIPTION

The ferryboat HAMPTON ROADS designed by Pusey & Jones for the Chesapeake Ferry Co., is engaged in the vehicular and passenger service between Sewall's Point, Norfolk and Newport News, Va. The main deck has driveways on either side of steel engine and boiler room trunk for vehicles. Passengers are accommodated in a built-in house.

Name—HAMPTON ROADS.
Owner—Chesapeake Ferry Co.
Builder—Pusey & Jones.
Naval Architect—A. M. Main.
Completed—July 25, 1925.

HULL PARTICULARS

Length overall, 197 feet; length between perpendiculars, 165 feet 7 inches; breadth molded, 46 feet 8 inches; depth molded, 15 feet 2½ inches; draft, 9 feet; displacement loaded, in tons, 970; passenger capacity, 1000; capacity for automobiles, 65; bunker fuel coal capacity in tons, 40; speed, 14 miles.

MACHINERY PARTICULARS

Main Engines—Two, 2-cylinder compound reciprocating engines arranged in tandem and direct connected to propellers at each end of the vessel through a continuous line of shafting. High pressure cylinders are 17 inches in diameter, low pressure cylinders are 34 inches in diameter, and 24-inch stroke, developing 1150 indicated horsepower at 125 revolutions per minute.

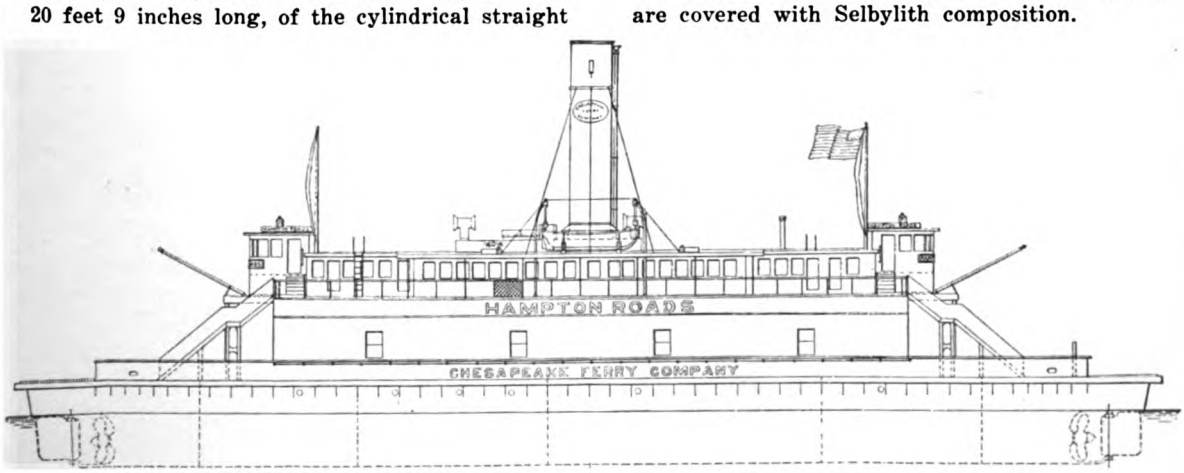
Boilers—Two, 10 feet 6 inches in diameter by 20 feet 9 inches long, of the cylindrical straight tube type, each having two Morison suspension furnaces, built by Pusey & Jones; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Warren Steam Pump Co.
Steering Engine—Hyde Windlass Co.
Valves—Crane. Co.
Propellers—Pusey & Jones.
Vehisote—The Pantasote Co.
Electric Generators—Kearfott Eng. Co.
Switchboard—Chas. Cory Co.
Communication—Chas. Cory Co.
Circulating Pump—P & J and Engberg.
Feed Water Heater—Griscom-Russell.
Injector-Ejector—Schutte & Koerting.

The passenger saloon is separated into spaces for colored and white, each portion being fitted similarly, with smoking rooms, lunch stand and toilets. Officers have rooms with metal beds, wardrobes and wash bowls. There is a complete kitchen and mess room for the crew. The floors of the toilets, lunch stand and kitchen are covered with Selbylith composition.



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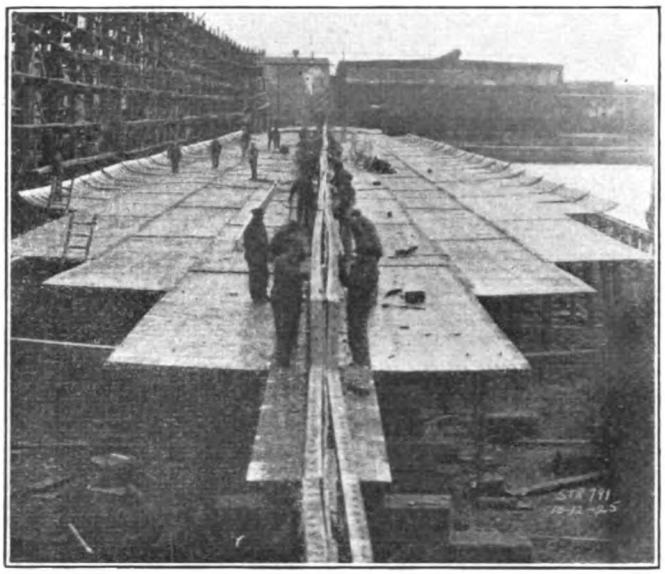
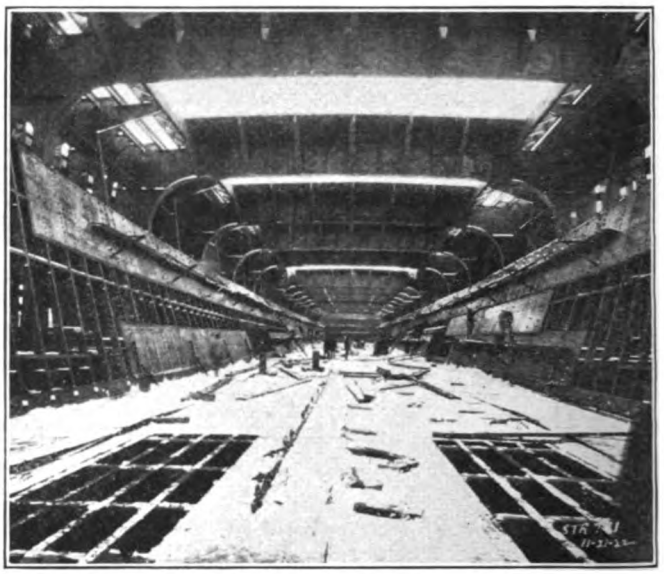
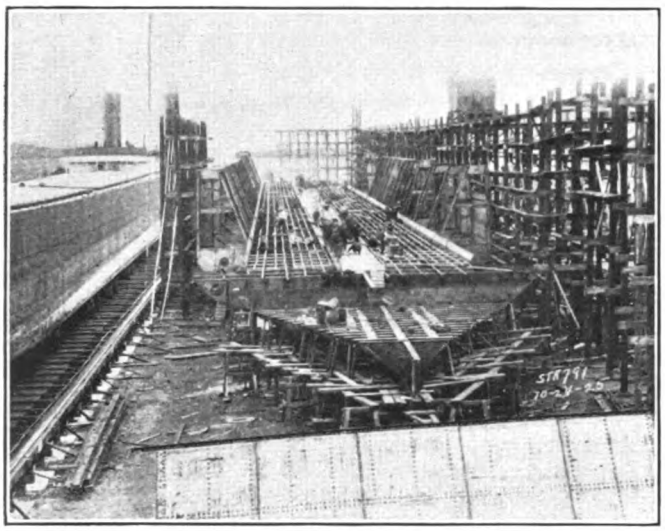
Steamship Col.



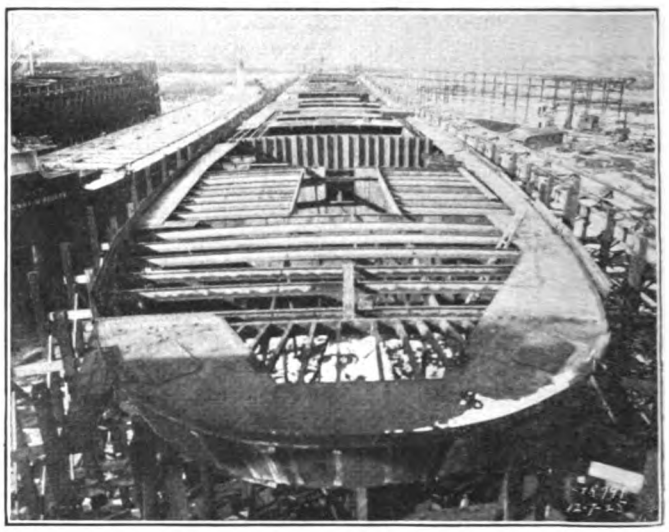
OCT. 12, 1925—KEEL LAID



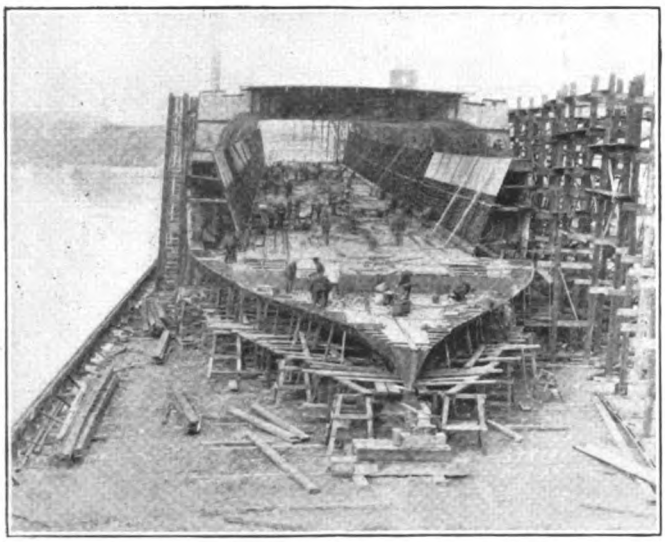
NOV. 21, 1925—INTERIOR VIEW



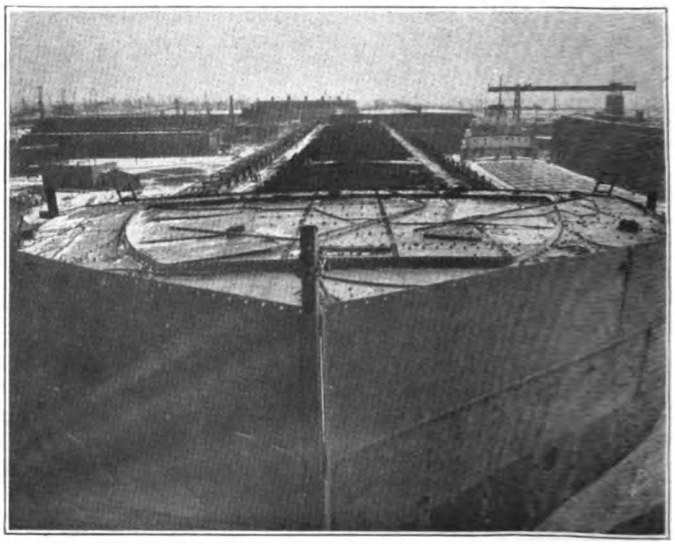
OCT. 24, 1925—FLOORS AND SIDE FRAMES



DEC. 7, 1925—PLACING DECK



NOV. 7, 1925—TANK TOP AND ARCHES



DEC. 29, 1925—PLATED AND DECKED

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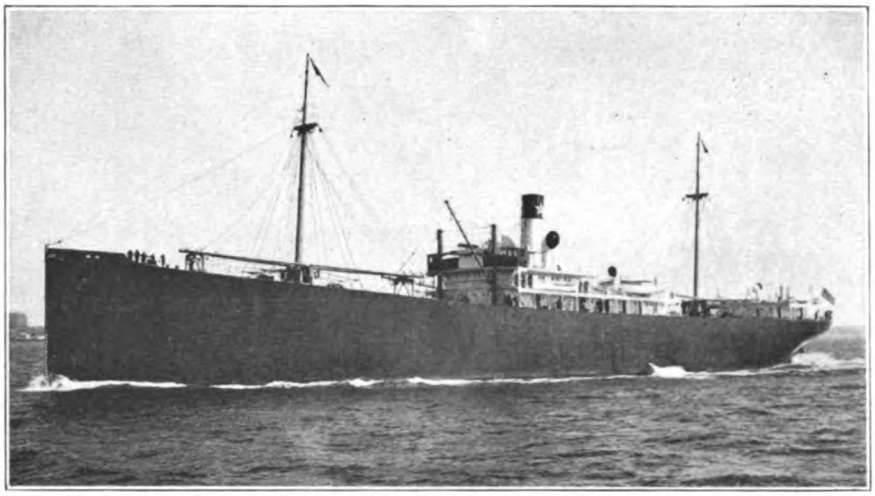
EL OCEANO—Express Freighter—Single Screw Turbine



Name—El Oceano.
Owner—Southern Pacific Steamship Lines.
Builder—Federal Shipbuilding & D. D. Co.
Naval Architect—A. S. Hebble.
Launched—Feb. 14, 1925.
Completed—April 30, 1925.
Classification—Equal to American Bureau.

HULL PARTICULARS

Length overall, 433 feet; length between perpendiculars, 415 feet; breadth molded, 56 feet; depth molded to hurricane deck, 37 feet; draft, 26 feet; displacement loaded, 11,780 tons; gross tonnage about 6767; net tonnage, 4171; deadweight, 7680 tons; cargo capacity, 6390 tons or 500,000 cubic feet; bunker fuel oil capacity about 1180 tons; speed designed 14¾ knots.

MACHINERY PARTICULARS

Main Engine—Cross compound marine turbines, driving a single shaft through double reduction gearing, of 5500 shaft horsepower. Turbines and gearing built by the De Laval Steam Turbine Co.

Boilers—Four Babcock & Wilcox water tube marine type of 4148 square feet of heating surface each; superheat, 705 square feet each; operating under forced draft and at a working pressure of 250 pounds per square inch; fuel, oil.

DESCRIPTION

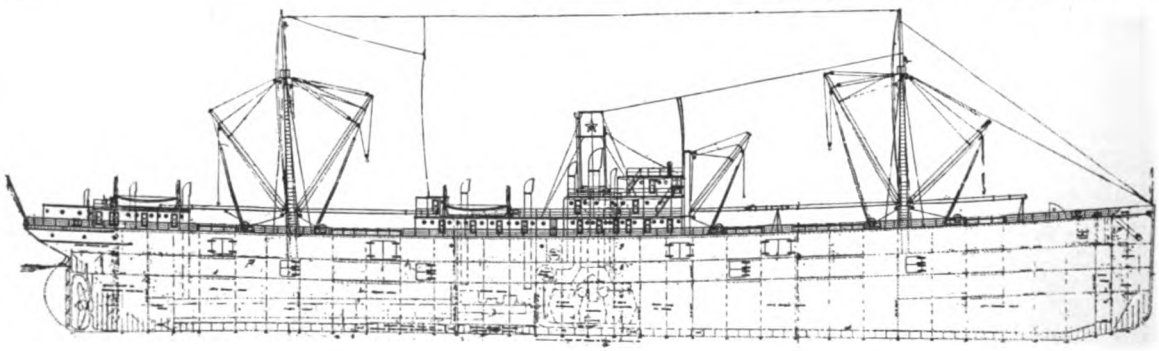
The unmistakable trend of the times is toward fast freighters. With a speed of nearly 14¾ knots this vessel will be able to outrun other freighters and to compete successfully with most of the combination passenger and cargo coastwise ships. For rapid handling of cargo there will be five large center line hatches and eight cargo ports on each side.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Warren Steam Pump Co.
Windlass—Hyde Windlass Co.
Winches—Hyde Windlass Co.
Steering Engine—Hyde Windlass Co.
Propeller—Wm. Cramp & Sons S. & E. B. Co.
Refrigeration—Brunswick Kroeschell Co.
Oil Burning Equipment—Todd and B. & W.
Stills—Davis Eng. Corp.
Life Saving Equip.—Welin Davit & Boat Corp.
Framing—Isherwood System.
Superheaters—Babcock & Wilcox.
Electric Generators—B. F. Sturtevant Co.
Amdyco—Bethlehem.
Anchor Chain—National Malleable.

A single screw express freight steamship with straight stem and elliptical stern with two steel polemasts, and three complete steel decks fore and aft with an orlop deck in addition in the forward hold. Cargo will be handled in a quick and economical manner. There will be two tubular steel booms on the forward and after side of each mast with a capacity of seven and one-half tons each, and in addition, two derrick posts will be fitted, each to have one tubular steel boom with a capacity of five tons. Eight winches.



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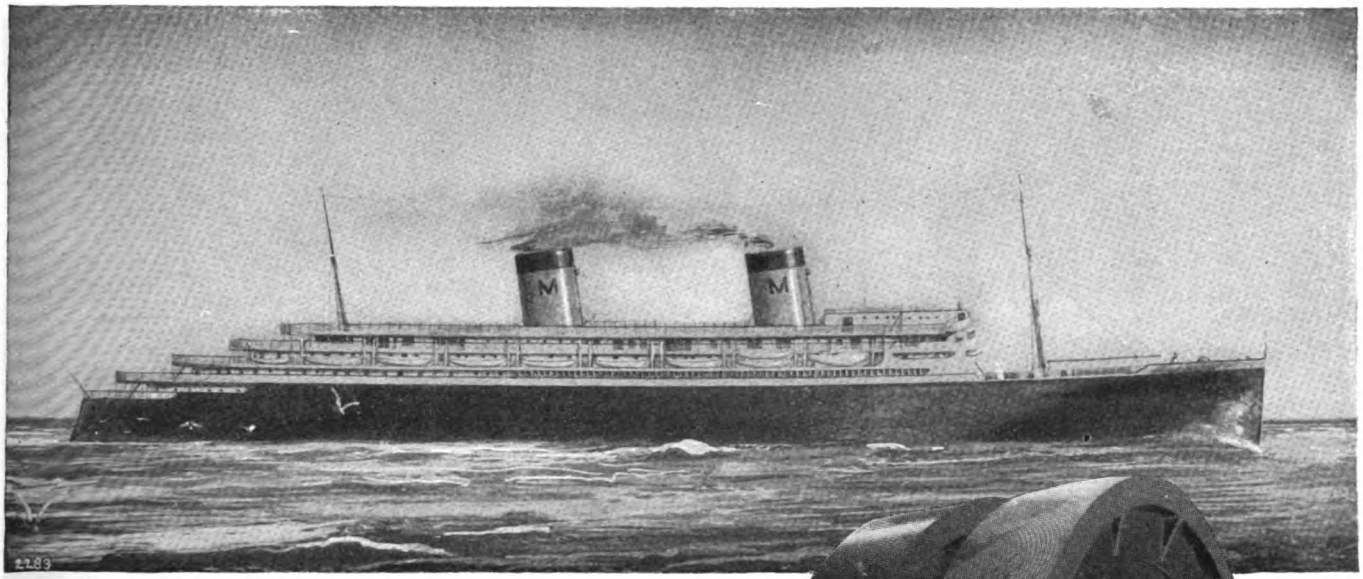
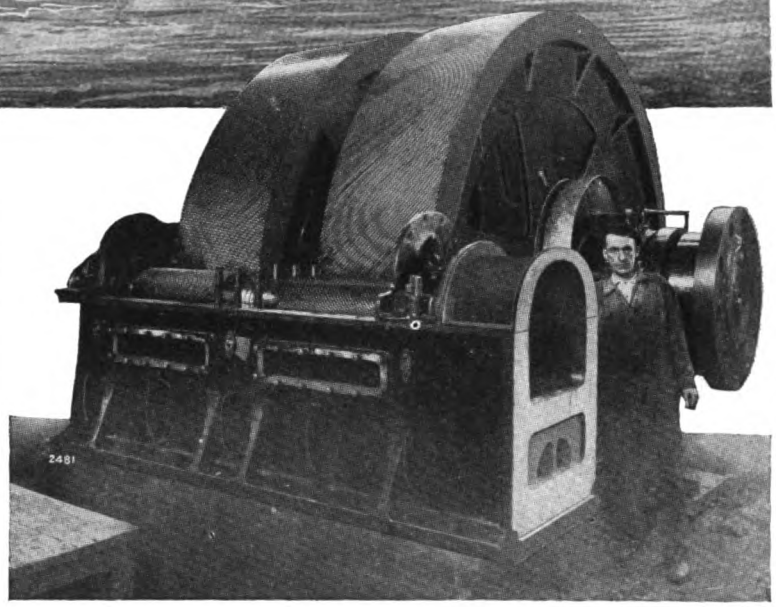
De Laval Gears In The Malolo





EACH of the propellers of the MALOLO is driven by a 12,500 H.P. compound steam turbine through two De Laval two pinion, single reduction gears giving a propeller speed of 120 r.p.m.

These are the largest marine gears yet built in this country, the pitch diameter being 141 ins. and the total width of the working face 57 ins.

De Laval Gears and Turbines

are installed on the most notable high class, high speed, merchant and passenger vessels recently completed or now being built, including EL OCEANO, EL COSTON (Ex-BIENVILLE), MUNARGO, CARIBOBO, BOSTON, NEW YORK, etc., also on the other fast scout cruisers TRENTON, RICHMOND, MEMPHIS, MARBLEHEAD and CONCORD. They have met with general approval due to their universally satisfactory performance in long continued service.

A number of De Laval marine gears have travelled over 600,000 miles and were in perfect condition when last inspected.

State type of vessel in which you are interested so that we may send particulars.

De Laval Steam Turbine Co.

Trenton, New Jersey

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LOCAL OFFICES
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Kansas City, Los Angeles, Montreal, New York, New Orleans

Manufacturers of Steam Turbines, Centrifugal Pumps, Centrifugal Blowers and Compressors, Double Helical Speed Reducing Gears, Worm Gears, Hydraulic Turbines, Flexible Couplings and Special Centrifugal Machinery

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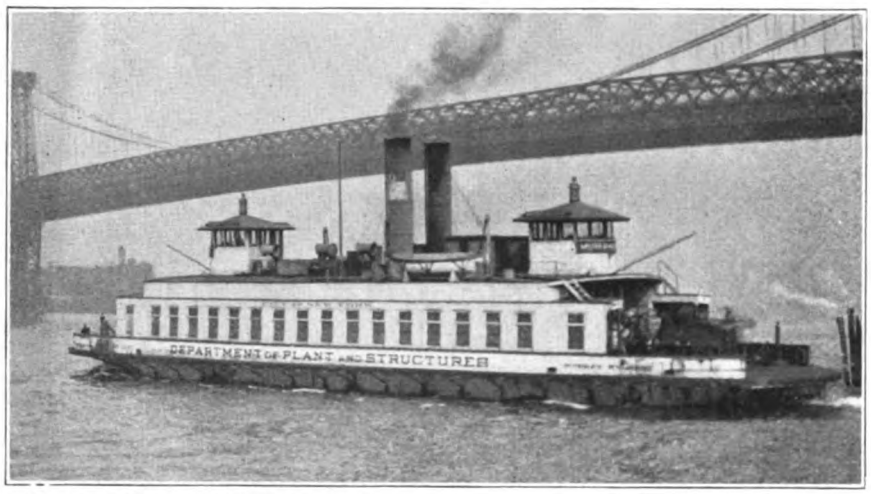
MURRAY HULBERT and Class—Ferry—Double Ended—Steam



DESCRIPTION

No less than 12 double ended steel hull ferry boats of this class, have been completed for the city of New York. About 150 tons of vehicles can be accommodated in the three teamways on the main deck. Two cabins are provided for passengers, giving a total capacity of 400 persons. These ferry boats are now in use by the city in the East river.

Name—MURRAY HULBERT & CLASS.

Number—Twelve.

Owner—City of New York.

Naval Architect—M. G. Kindlund & D. P. S.

Builders—Two by John W. Sullivan Co., (JOSEPH J. O'BRIEN, JOSEPH A. GUIDER); launched, Aug. 6, Sept. 22, 1925; completed, Nov. 23, 1925, Jan. 12, 1926.—Five by Staten Island Shipbuilding Co., (JOHN A. LYNCH, HENRY BRUCKNER, WILLIAM T. COLLINS, HENRY A. MEYER, FRANK A. CUNNINGHAM); launched, March 26, June 27, July 14, Nov. 9, and Nov. 27, 1925; completed, July 9, Aug. 8, Sept. 1, Dec. 3, and Dec. 24, 1925.—Five by Todd Shipyards Corp., Tebo plant, (MURRAY HULBERT, EDWARD RIEGELMANN, JULIUS MILLER, MAURICE E. CONNOLLY, JOHN H. MCCOOEY); launched, Dec. 27, Dec. 27, 1924, Jan. 27, April 23, and June 9, 1925; completed, July 9, Aug. 7, Aug. 21, Sept. 12, and Oct. 10, 1925.

Classification—American Bureau of Shipping.

HULL PARTICULARS

Length overall, 151 feet; length outside endposts, 148 feet; length between perpendiculars, 129 feet; breadth molded, 37 feet 6 inches; breadth over guards, 53 feet; depth molded, 15 feet; draft, 8 feet 6½ inches; displacement loaded, 700 tons; gross tonnage, 593; net tonnage, 403; passenger capacity, 400; capable of carrying 150 tons of vehicles; bunker fuel capacity, 30 tons of oil; speed about 12.8 statute miles per hour.

MACHINERY PARTICULARS

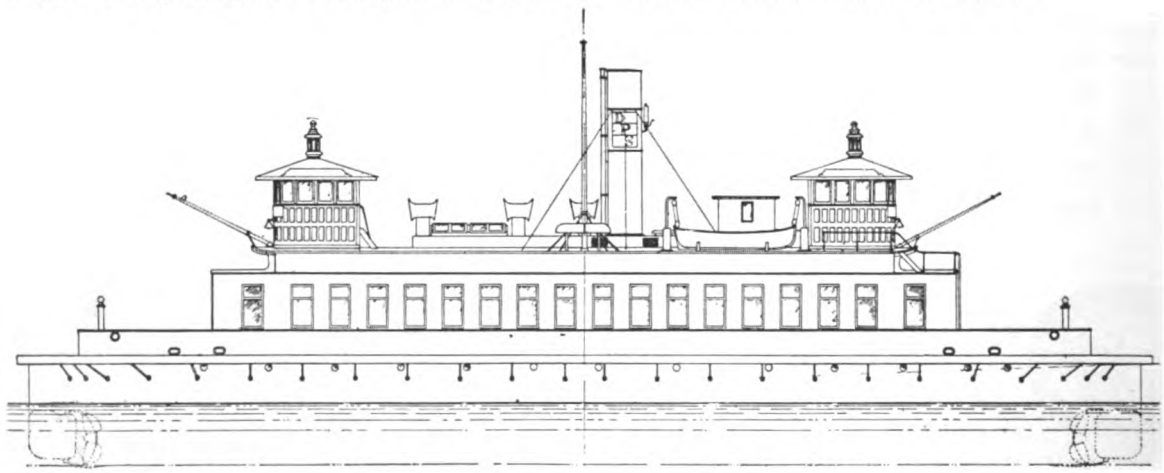
Main Engines—Built by Staten Island S. B. Co., Todd Shipyards Corp. and John W. Sullivan Co.; two for each ferry boat; vertical compound steam engines, 12 x 26 inches diameter of cylinders and 18 inches stroke.

Boilers—Two for each vessel, built by Babcock & Wilcox Co.; water tube type of 1550 square feet of heating surface each; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Davidson; Dean, Morris Machine Wks.
Steering Engine—Hyde Windlass Co.
Propellers—By the Shipyards.
Oil Burning Equip.—Todd Oil Burner.
Electric Generators—General Electric.
Feed Water Heaters—Davis Eng. Corp.
Fire Extinguishers—Bethlehem-Amdyco.
Plymetl—Haskelite Mfg. Corp.
Turbine Blowers—B. F. Sturtevant.



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Distinctive Ships

Name	Service	Drive
SS Joseph Medill	Fire Boat	Turbine-electric
SS Graeme Stewart	Fire Boat	Turbine-electric
USS Langley (ex-Jupiter)	Airplane Carrier	Turbine-electric
USS New Mexico	Battleship	Turbine-electric
USS California	Battleship	Turbine-electric
USS Maryland	Battleship	Turbine-electric
USS West Virginia	Battleship	Turbine-electric
SS Eclipse	Cargo	Turbine-electric
SS Invincible	Cargo	Turbine-electric
SS Archer	Cargo	Turbine-electric
SS Independence	Cargo	Turbine-electric
SS Victorious	Cargo	Turbine-electric
SS Cuba	Pass.-Cargo	Turbine-electric
MS Mariner	Trawler	Diesel-electric
SS Tampa	Coast Guard Cutter	Turbine-electric
SS Haida	Coast Guard Cutter	Turbine-electric
SS Mojave	Coast Guard Cutter	Turbine-electric
SS Modoc	Coast Guard Cutter	Turbine-electric
SS San Benito	Pass. Cargo	Turbine-electric
HIJMS Kamoi	Fuel Ship	Turbine-electric
MS Fordonian	Cargo (Great Lakes)	Diesel-electric
MS Golden Gate	Ferryboat	Diesel-electric
MS Golden West	Ferryboat	Diesel-electric
MS Golden State	Ferryboat	Diesel-electric
SS Hayward	Ferryboat	Turbine-electric
SS San Leandro	Ferryboat	Turbine-electric

Name	Service	Drive
MS Standard Service	Tanker	Diesel-electric
MS Alaskan Standard	Tanker	Diesel-electric
SS W. R. Hearst	Ferryboat	Turbine-electric
SS Rodman Wanamaker	Ferryboat	Turbine-electric
SS Geo. W. Loft	Ferryboat	Turbine-electric
MS Twin Ports	Cargo (Great Lakes)	Diesel-electric
MS Twin Cities	Cargo (Great Lakes)	Diesel-electric
USS Lexington	Airplane Carrier	Turbine-electric
USS Saratoga	Airplane Carrier	Turbine-electric
MS La Playa	Pass.-Cargo	Diesel-electric
MS La Marea	Pass.-Cargo	Diesel-electric
MS Hawaiian Standard	Tanker	Diesel-electric
MS Van Dyke—No. 1	Tug & Fire Boat	Diesel-electric
MS Van Dyke—No. 2	Tug & Fire Boat	Diesel-electric
MS Van Dyke—No. 3	Tug & Fire Boat	Diesel-electric
MS Brilliant	Tanker	Diesel-electric
MS F. M. Coots	Ferry	Diesel-electric
SS T. W. Robinson	Bulk Freighter	Turbine-electric
MS Lake Weir	Dredge	Diesel-electric
MS Bear	Coast Guard Cutter	Diesel-electric
For U.S. Engineer Corps	Towboat	Diesel-electric
For U.S. Engineer Corps	Towboat	Diesel-electric
For U.S. Engineer Corps	Towboat	Diesel-electric
For IMM	Passenger-Cargo	Turbine-electric
For New York Central	Tug	Diesel-electric
For New York Central	Tug	Diesel-electric

Complete data covering these equipments appeared in the January issue of this paper. Copies will be supplied at your request.

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—and every year sees the list increase

The U. S. Navy requires 180,000 h.p. in a single ship, the small-ship owner 100 h.p., and G-E Electric Drive meets the demands of both. Between these extremes lies almost every other class of vessel, with G-E equipment represented and successful in every one.

The records of the above ships constitute an operating history of electric drive—both turbine-electric and Diesel-electric. From the first installation, in 1908, to the latest, there has been a steady advance, a continual refinement in electric propulsion machinery, accompanied by marked improvement in operation.

Remember, too, that General Electric can serve you in furnishing electrical equipment for your auxiliaries, for lighting, and for power supply, distribution, and control.

By specifying G-E Equipment throughout you gain the assurance of correct design, the best materials obtainable, workmanship of undoubted character, and operating fitness established by a thorough test before delivery.

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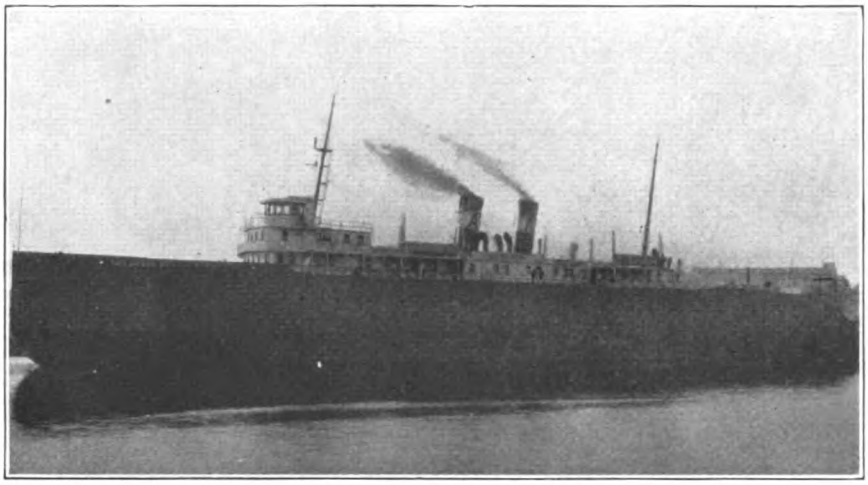
ANN ARBOR NO. 7—Car Ferry—Twin Screw—Steam



DESCRIPTION

This car ferry built for the Ann Arbor railroad. by the Manitowoc Shipbuilding Corp., is practically a duplicate of the car ferry constructed by the same company for the Pere Marquette railroad. These ferries are large, powerful and fast and are used effectively as ice breakers, to maintain their schedules.

Name—ANN ARBOR No. 7.
Owner—Ann Arbor railroad.
Builder—Manitowoc S. B. Corp.
Naval Architect—Manitowoc S. B. Corp.
Launched—Dec. 20, 1924.
Completed—Feb. 21, 1925.
Classification—None.

HULL PARTICULARS

Length over all, 360 feet; length between perpendiculars, 348 feet; breadth molded, 56 feet; depth molded, 21 feet 6 inches; draft, 16 feet; displacement loaded, 6380 ;gross tonnage, 2934; net tonnage, 1426; passenger capacity, 100; cargo capacity. 30 cars; cargo capacity cubic feet, 28 freight cars; bunker fuel coal capacity in tons, 400; speed, 14 miles.

MACHINERY PARTICULARS

Main Engines—Two triple expansion; size, 20½ x 34 x 56 inches x 36-inch stroke; built by Manitowoc Shipbuilding Corp.

Boilers—Four Scotch marine type; size, 14 feet 6 inches in diameter by 11 feet long; 185 pounds working pressure; built by Manitowoc Shipbuilding Corp.; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Dean Bros. & Kingsford F. & M. Co.

Windlasses—American Hoist & Derrick Co.

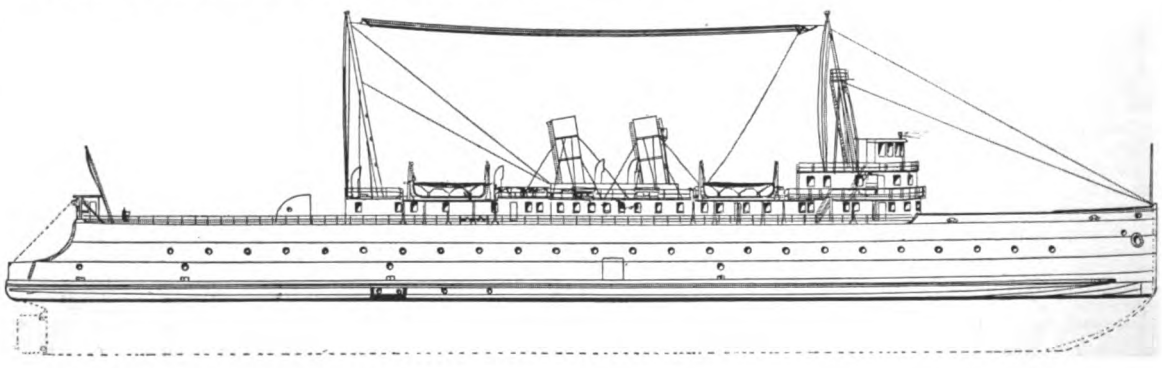
Steering Engine — Manitowoc Shipbuilding Corp.

Refrigeration—Brunswick-Kroeschell.

Electric Generators—Two, 15 k.w., Engberg.

Plywood—Hasketite Mfg. Corp.

The car ferry ANN ARBOR No. 7 is built on the transverse system of framing and though not classed, all the scantlings are equal to or greater than the requirements of the American bureau of shipping. In hull and in machinery this vessel compares in size with an ocean freighter. On account of the considerable power in the main propelling engines. and as this ferry is twin screw, the machinery, in fact, is much more elaborate and complete than in the ordinary freighter. Each of the two reciprocating engines develops 1350 indicated horsepower. The builders of this ferry have under way now an even larger and more powerful car ferry for the Wabash railroad. It may be said that this shipbuilding company is now qualified as specialists in the building of large powerful ferries for transporting railroad cars under the conditions existing on the Great Lakes.



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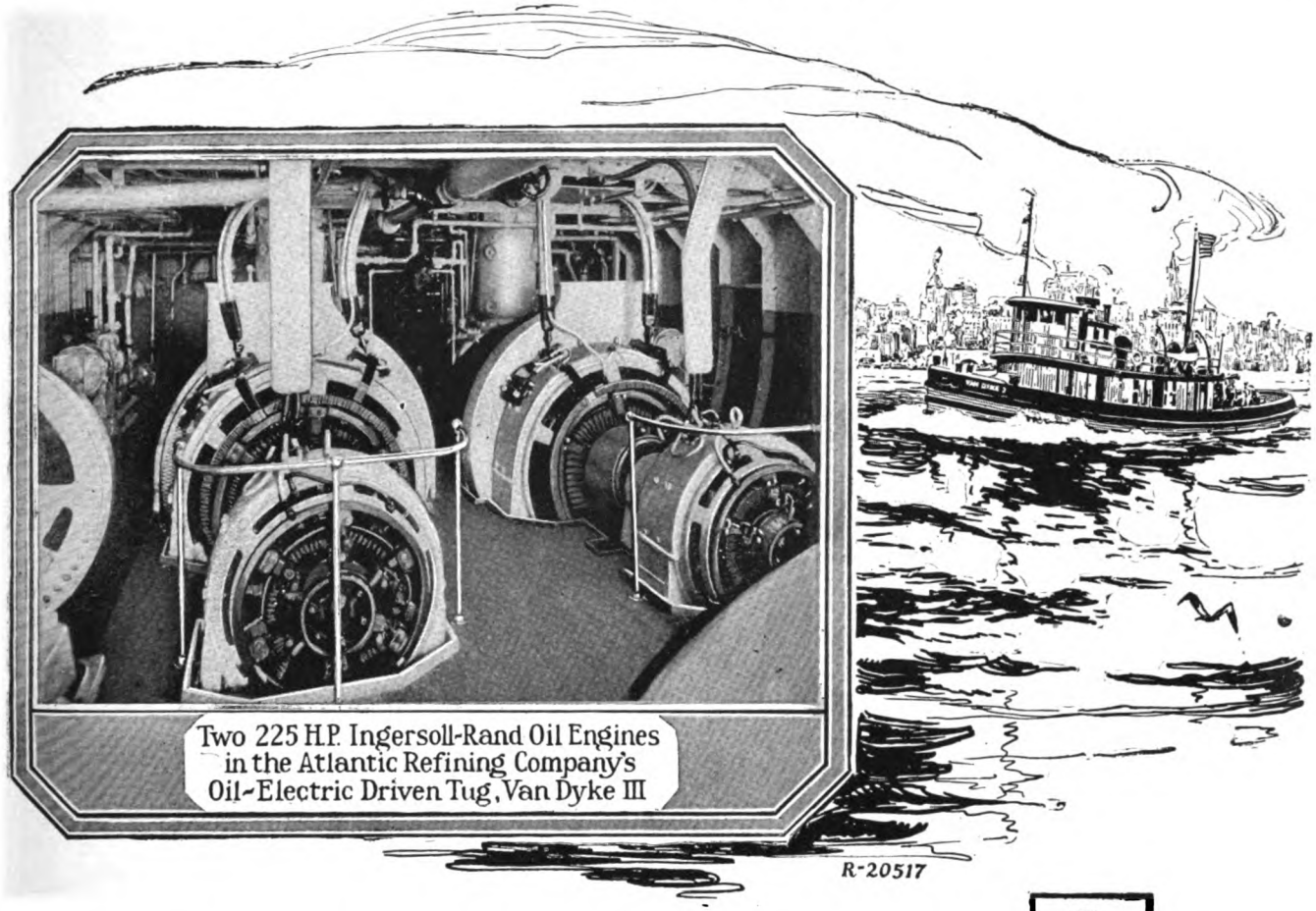

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Reduce Both Crew and Costs

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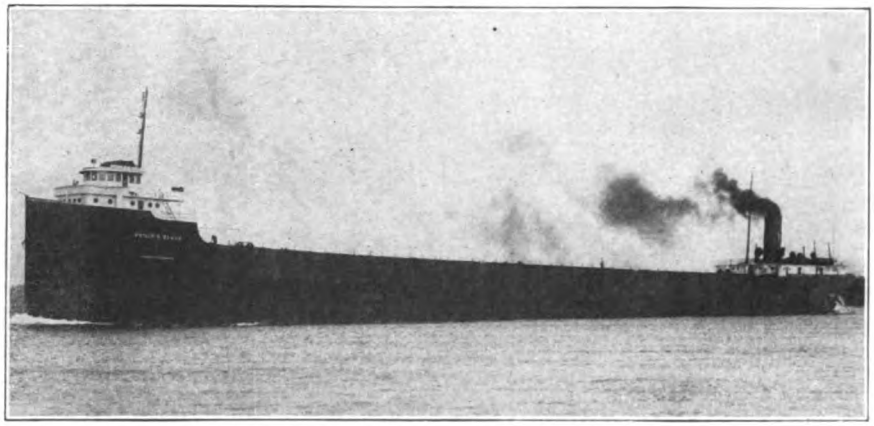
PHILIP D. BLOCK—Freighter Great Lakes—Single Screw Steamer



DESCRIPTION

This vessel is a typical, modern Great Lakes freighter of the standard type of construction. She can carry a tremendous cargo of coal or ore and can be discharged in a very short period of time. Power is furnished by Scotch boilers burning coal, and a triple expansion steam engine.

Name—PHILIP D. BLOCK.
Owner—Pioneer Steamship Co.
Builder—American Ship Building Co.
Naval Architect—A. W. Cross, Am. S. B. Co.
Launched—Jan. 17, 1925
Completed—April 10, 1925
Classification—Equal to American Bureau.

HULL PARTICULARS

Length overall, 600 feet; length between perpendiculars, 580 feet; breadth molded, 60 feet; depth molded, 32 feet; draft loaded, 21 feet; displacement loaded, 20,024 tons of 2000 pounds each; gross tonnage, 7932; net tonnage, 6201; cargo capacity, 14,618 short tons; cargo capacity, cubic feet, 640,750; bunker fuel capacity in tons of coal, 500; speed, 12 statute miles per hour.

MACHINERY PARTICULARS

Main Engine—1 triple expansion reciprocating steam engine built by the American Ship Building Co.; size, 24½ x 41 x 65 inches x 42-inch stroke; indicated horsepower, 2200.

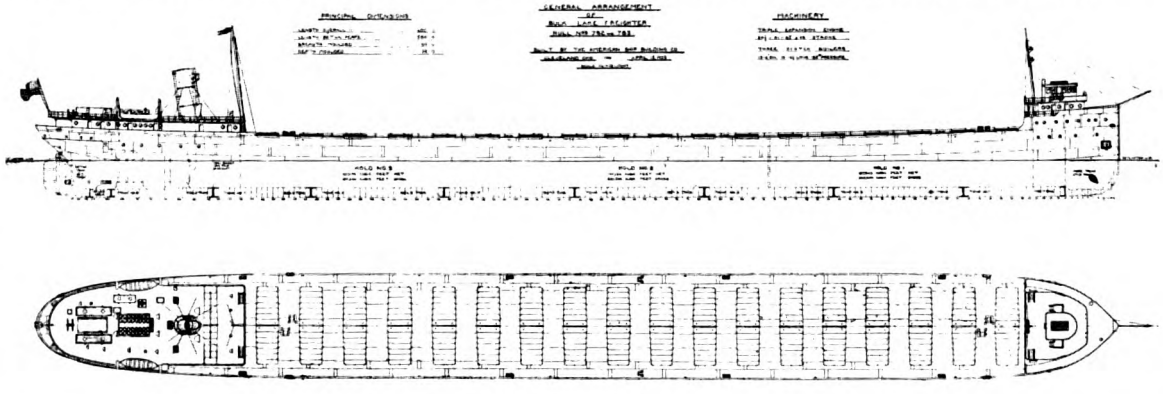
Boilers—Number 3; name of maker, American Ship Building Co.; type, Scotch; coal burners, size, 13 feet 6 inches by 11 feet; working pressure, 185 pounds per square inch; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Morris and Union Steam Pump.
Windlasses—American Ship Building Co.
Winches—American Ship Building Co.
Steering Engine—American Ship Building Co.
Propeller—American Ship Building Co.
Refrigeration—Brunswick-Kroecshell Co.
Superheaters—Power Specialty Co.—Foster
Electric Generator—Engberg
Anchor Chain—National Malleable Co.

The Philip D. Block is in practically every respect typical of the more or less standardized type of Great Lakes bulk carrier. She has the usual triple expansion reciprocating steam engine for which steam is supplied by three Scotch boilers. Coal of course is used on grates in firing these boilers. The cargo capacity at a draft of 21 feet is 14,618 short tons. Though not actually classed the hull structure of the ship and her engineering details are equal to the requirements of the American bureau of shipping. This ship has been in constant continuous operation throughout all of last year and has given good satisfaction in service. The vessel is the product of the American Ship Building Co. throughout, engine, boilers and hull. Though there is no radical departure in this vessel from the usual type, she represents fairly the well-built standard lake carrier.



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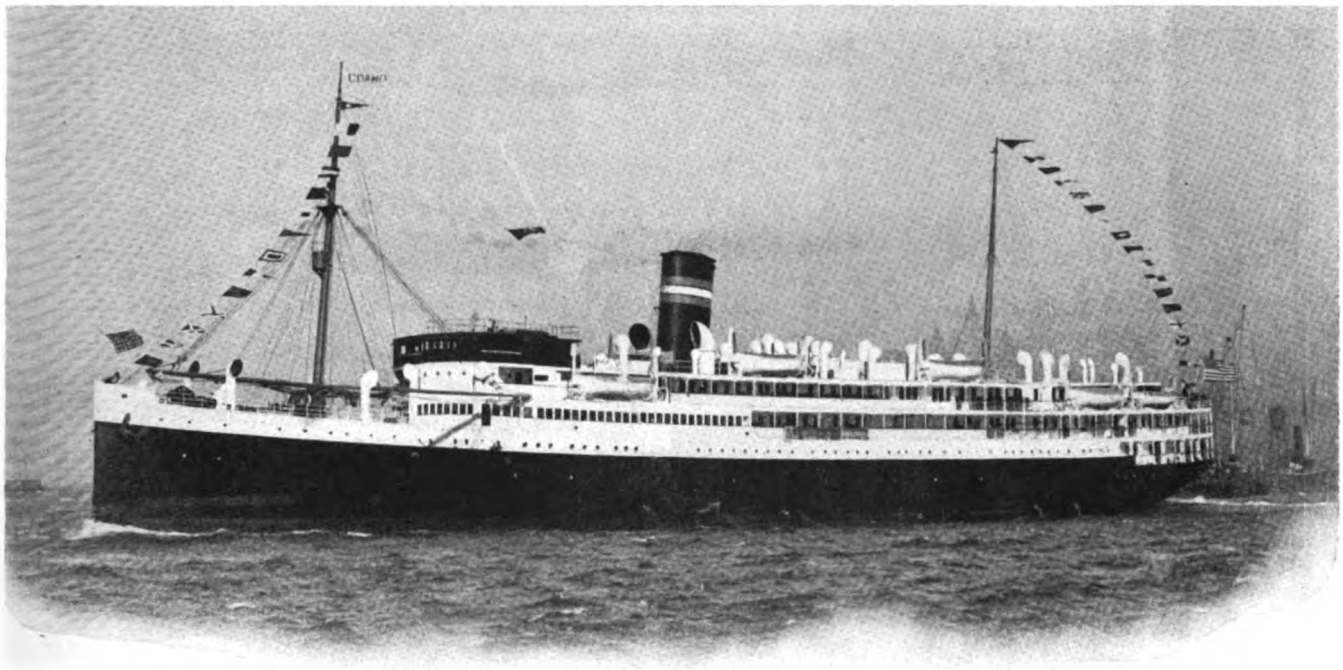

"THE COAMO"

The Coamo Uses Brunswick-Kroeschell Refrigeration

MOREOVER, of the twenty-two ships, out of the fifty-two mentioned in this section, for which refrigerating equipment has already been ordered, nineteen are Brunswick-Kroeschell equipped.

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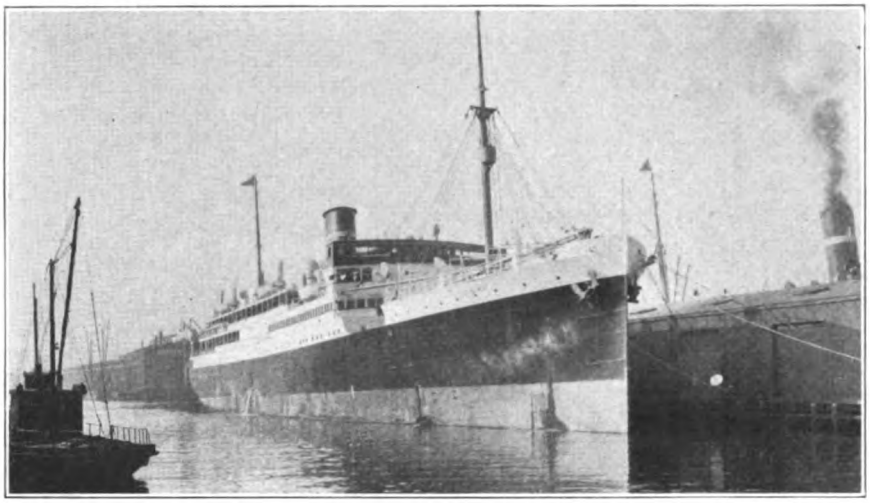
COAMO—Passenger—Ocean—Single Screw Turbine



DESCRIPTION

The COAMO is a combination passenger and cargo vessel capable of carrying 287 first class and 90 second class passengers and 4200 tons of cargo at a speed of 16 knots. She sailed on her maiden voyage in the run between New York and Porto Rico on Jan. 7. The main drive is steam turbine with double reduction gears and Scotch type boilers burning oil.

Name—COAMO.
Owner—Coamo Steamship Co. (N. Y. P. R.)
Builder—Newport News Shipbuilding & D. D.
Naval Architect—Theodore E. Ferris.
Launched— July 22, 1925.
Completed—Dec. 22, 1925.
Classification—American Bureau Shipping.

HULL PARTICULARS

Length overall, 429 feet; length between perpendiculars, 412 feet; breadth molded, 59 feet 6 inches; depth molded to hurricane deck, 35 feet; draft, 24 feet 6 inches; displacement loaded, 10,500 tons; gross tonnage estimated, 6700; net tonnage, 4500; passenger capacity, 287 first class and 90 second class; cargo capacity, 4200 tons or 237,700 cubic feet; bunker fuel oil capacity, 993 tons; speed, 16 knots.

MACHINERY PARTICULARS

Main Engine—One Curtis-Brown impulse type geared turbine, built by Newport News Shipbuilding & Drydock Co.; size, 6000 shaft horsepower.

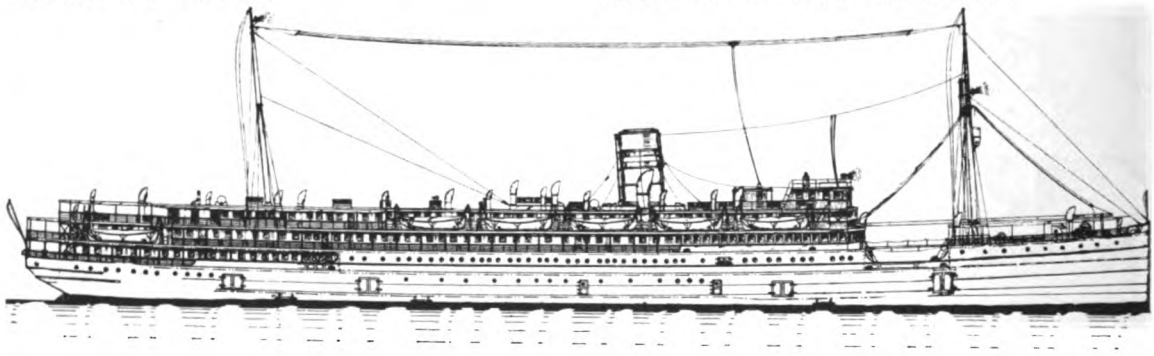
Boilers—Five single ended Scotch type, built by Newport News Shipbuilding & Drydock Co.; size, 16 feet 6 inches inside diameter by 12 feet 3 inches long; fuel oil.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Worthington Pump & Machinery.
Windlass—American Engineering Co.
Winches—Lidgerwood Manufacturing Co.
Steering Engine—American Engineering Co.
Propeller—Newport News S. B. & D. D. Co.
Anchor Chain—National Malleable.
Deck Windows—Kearfott Eng. Co. Inc.
Refrigeration—Brunswick Kroeschell Co.
Oil Burning Equip.—Dahl-Bethlehem.
Electric Generators—Westinghouse.
Life Saving Equip.—Welin Davit & Boat Corp.
Oil Heaters and Coolers—Griscom-Russell Co.
Feed Water Heater—Griscom-Russell Co.
Radio—Independent Wireless Co.
Vehisote—Pantasote Co. Inc.

At a cost of approximately two and one-half million dollars it can be said that no expense has been spared to make this vessel for her size one of the finest ships afloat. The passenger accommodations have been designed to meet the experienced knowledge of her owners gained during many years of operation in the New York to Porto Rico trade. Good cargo equipment. Air cooled cargo space.



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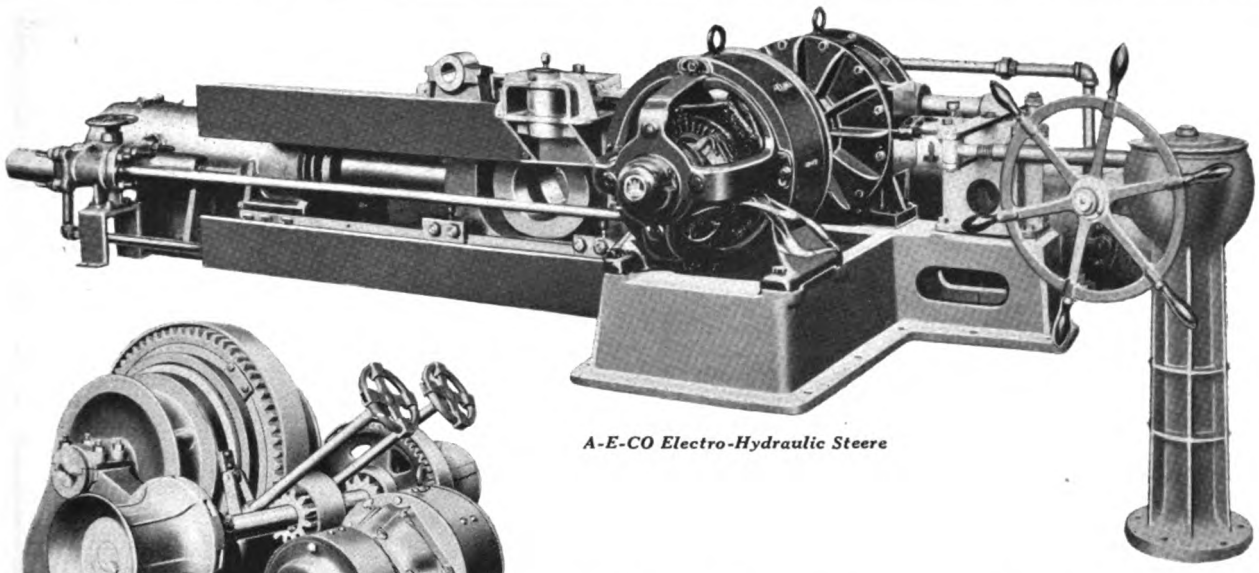
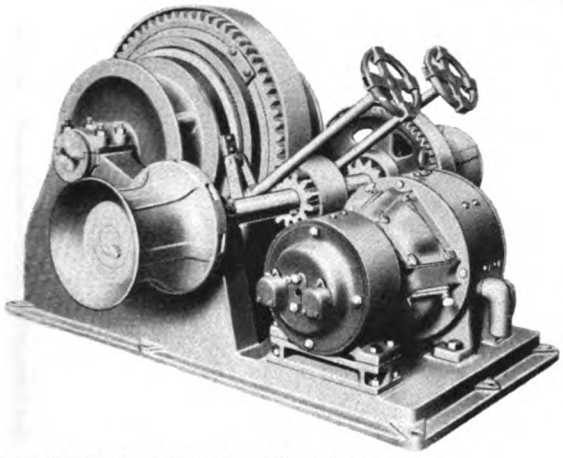


A-E-CO Electro-Hydraulic Steere



A-E-CO Electric Spur Geared Windlass

The Deck machinery of America's finest ships

SINCE 1857, thousands of ships of every size and type have been equipped with steerers, windlasses, hoists, capstans and other auxiliaries designed and built in our shops.

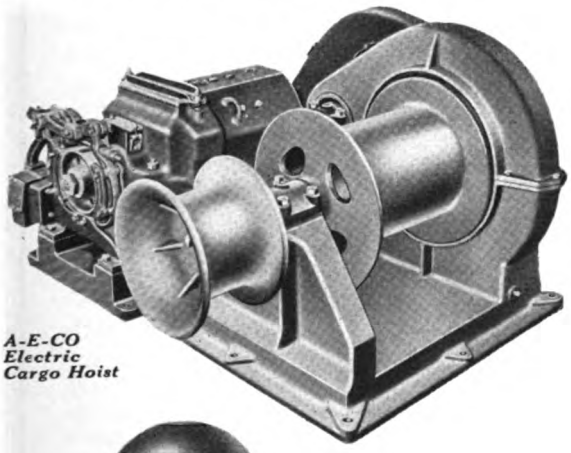
Leadership, won on sheer merit, has been maintained for over a half a century by adherence to a policy that is satisfied with nothing but the best, by consistent performance in service, and by meeting the ever-changing requirements of the marine field.

In our shops were built the first steam steering gear and the first steam windlass in America. With the advent of the motorship, a complete line of electrically driven machines was perfected. And finally the A-E-CO Electro-Hydraulic Auxiliaries—the last word in ship machinery—were developed.

Today the vast majority of the finest ships afloat have A-E-CO Auxiliaries.

Installations, in the past year, include—*Airplane Carriers* Lexington and Saratoga; *Motorships* East Indian and Benson Ford; *Steamers* Coamo, Robert E. Lee, Mohawk, Seminole and Cherokee; *Ferryboats* Froman M. Coots and George W. Loft; *Barges* 605 and 608 of the Pennsylvania R. R.; *Tugs* Russel No. 3 and Goodwin No. 14; *Yachts* Aloha and Shadow K;—and hundreds of other well-known ships.

The complete line of A-E-CO Auxiliaries includes a wide variety of hand, steam, gasoline, electric and electro-hydraulic machines. For descriptions, illustrations and other details, send for Catalog 21.



A-E-CO Electric Cargo Hoist

A-E-CO Electric Capstan

American Engineering Company

2413 Aramingo Ave., Philadelphia, Pa.

Boston, New York, Philadelphia, Cleveland, Seattle, Vancouver

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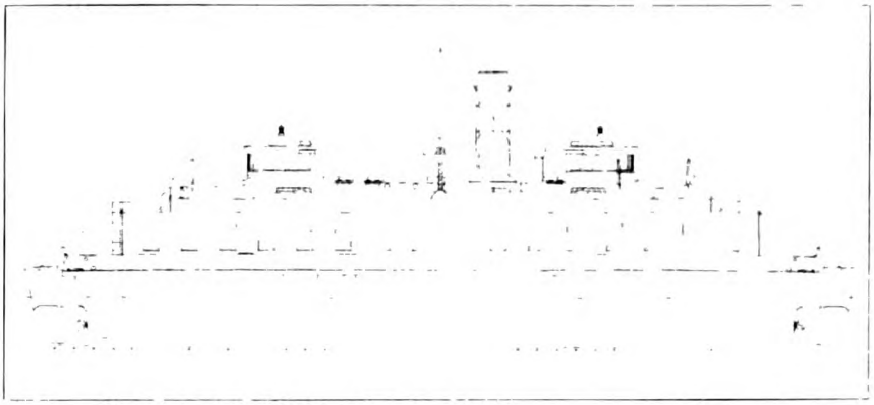
HULL NOS. 1398 and 1399—Ferry Double Ended—Screw Steamer



DESCRIPTION

Two ferry boats of this type now under construction for the city of Boston are intended for service between Boston and East Boston. They are designed primarily for the heavy trucking traffic of the water fronts. In addition they also have side cabins for passengers.

Name—HULL NOS. 1398 and 1399.
Owner—City of Boston.
Builder—Beth. S. B. Corp., Fore River Plant.
Naval Architect—Div. of Ferries, Boston.
Launched—Not yet launched.
Completed—Under construction.
Classification—American Bureau of Shipping. Class, A-1E for ferry service.

HULL PARTICULARS

Length overall, 174 feet 4 inches; length between perpendiculars, 172 feet; breadth molded, 40 feet 8 inches; depth molded, 16 feet 6 inches; draft, light, 10 feet 4 inches; displacement light, 925 tons; bunker fuel capacity, 30 tons.

MACHINERY PARTICULARS

Main Engines—Two compound expansion steam engines to be built by Fore River plant. Beth. S. B. Corp.; size, 15 x 30 inches and 24-inch stroke.

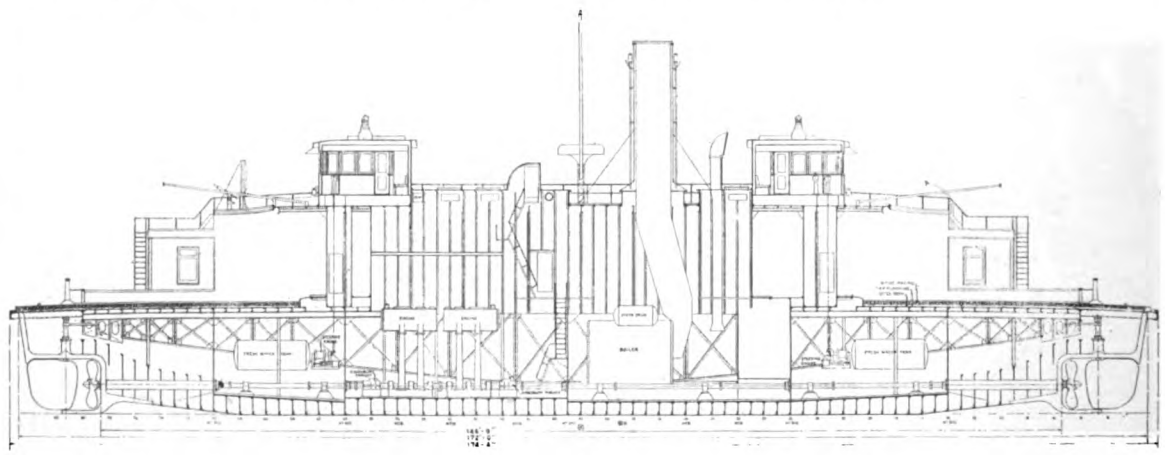
Boilers—Number two; of Scotch type; built by the Harlan plant of the Beth. S. B. Corp.; size, 11 feet in diameter x 13 feet long; working pressure, 150 pounds per square inch; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Warren and Beth. S. B. Corp.
Steering Engine—Bethlehem S. B. Corp.
Propellers—Bethlehem S. B. Corp.
Condensers—Warren Steam Pump Co.
Thrust Bearings—Kingsbury.
Turbines for Fire Pumps—B. F. Sturtevant.
Electric Generators—Westinghouse.
Fire Extinguishers—Bethlehem S. B. Corp.
Emergency Lighting—Storage batteries.
Feed Water Heater—Griscom-Russell.
Valves—Crane Co.

These ferry boats are to be built under the special survey of the American bureau of shipping and are to comply with the rules and regulations of the United States steamboat inspection service. The hulls are divided by five watertight steel bulkheads into six watertight compartments. The main frames are of 6-inch x 3-inch x 12.2-pound bulb angles spaced 24 inches throughout and with special 15-inch built-up web frames in the boiler and engine spaces, three to each compartment. The main deck with its wide overhang, is fully plated and supported by heavy 7-inch channel beams on each frame.

Two longitudinal trusses 12 feet 6 inches off center line and extending between transom frames are built-up from the second side keelson with a 12-inch channel top stringer directly under the deck beams.



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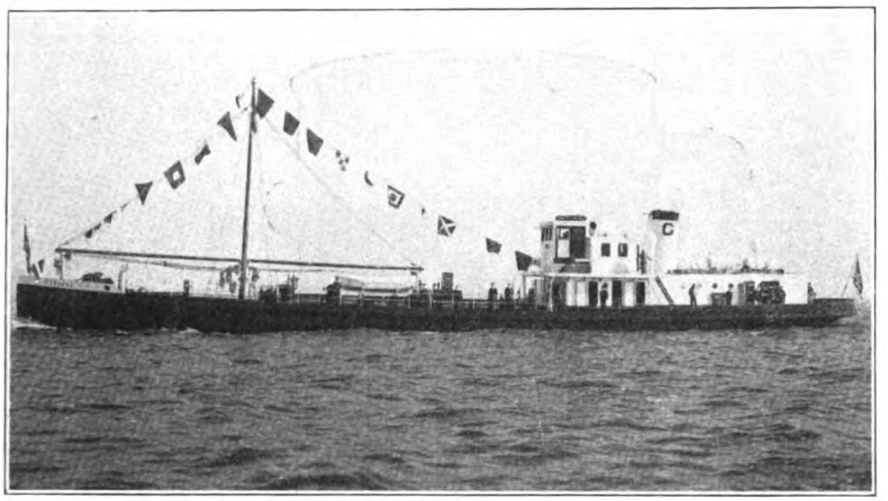
GENERAL—Tanker—Single Screw Diesel Electric



DESCRIPTION

This little vessel represents an increasingly popular type of boat by which deliveries of petroleum may be made from the large storage plants to smaller places on rivers and bays. It is the most direct and economical method of transfer. The electric drive gives perfect speed control in maneuvering, and exceptional flexibility.

Name—GENERAL.

Owner—General Petroleum Corp.

Builder—Bethlehem Shipbuilding Corp., Ltd., Union Plant.

Naval Architect—E. P. McRitchie.

Launched—Oct. 28, 1925.

Completed—Jan. 7, 1926.

Classification—American Bureau.

HULL PARTICULARS

Length overall, 176 feet 6 inches; length between perpendiculars, 170 feet; breadth molded, 32 feet; depth molded, 14 feet; draft loaded, 11 feet 9 inches; displacement loaded, 1372 tons; gross tonnage, 560; net tonnage, 364; cargo capacity, 900 tons, or 6000 barrels of fuel oil, or 35,646 cubic feet total, allowing for expansion; bunker fuel capacity in tons, 15; speed loaded, 8½ knots.

MACHINERY PARTICULARS

Main Engine—One, 350 shaft horsepower, at 160 revolutions per minute, Westinghouse electric motor. Current to this main drive motor is furnished by two main generators of 145 kilowatts each at 275 revolutions per minute, of Westinghouse manufacture. Each generator has an attached exciter of 20 kilowatts. Each generator is driven by one 250 brake horsepower, at 275 revolutions per minute, 6 cylinder, 4 cycle Atlas Imperial Corp., diesel engine.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—General service, and bilge pump, of Worthington make.

Windlass—Electric driven, Allen Cunningham.

Steering Engine—Allen Cunningham type.

Propeller—One Bethlehem Shipbuilding Corp.

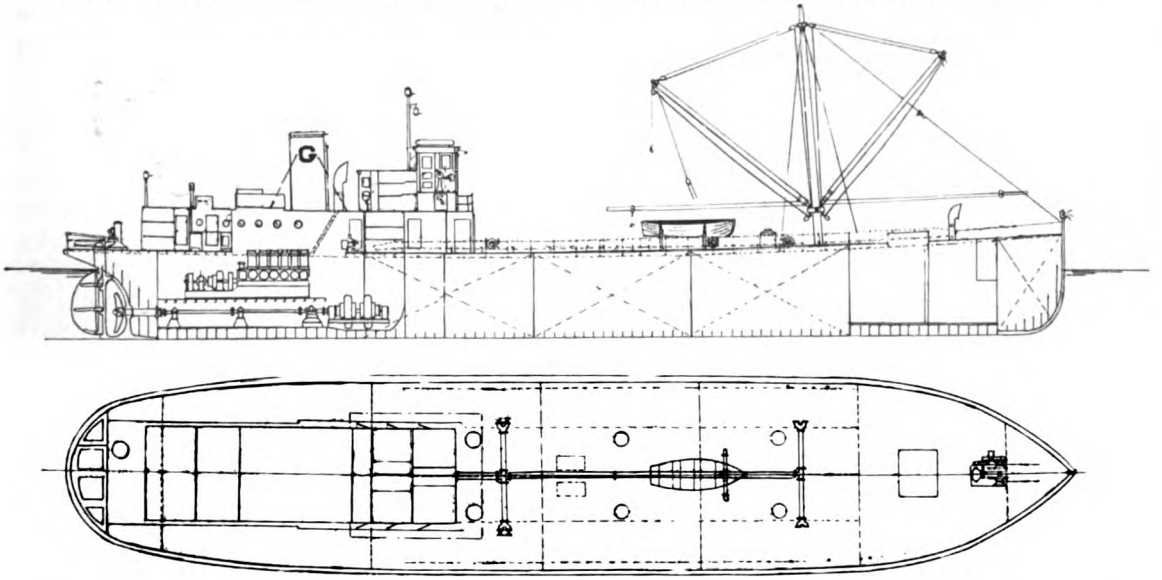
Electric Generators—Westinghouse Electric.

Winches—Allen Cunningham.

Fuel Oil Pump—Northern Pump Co.

Thrust Bearings—Kingsbury.

Diesel electric single screw oil tanker for service in San Francisco Bay, classified for petroleum in bulk, bay and river service.



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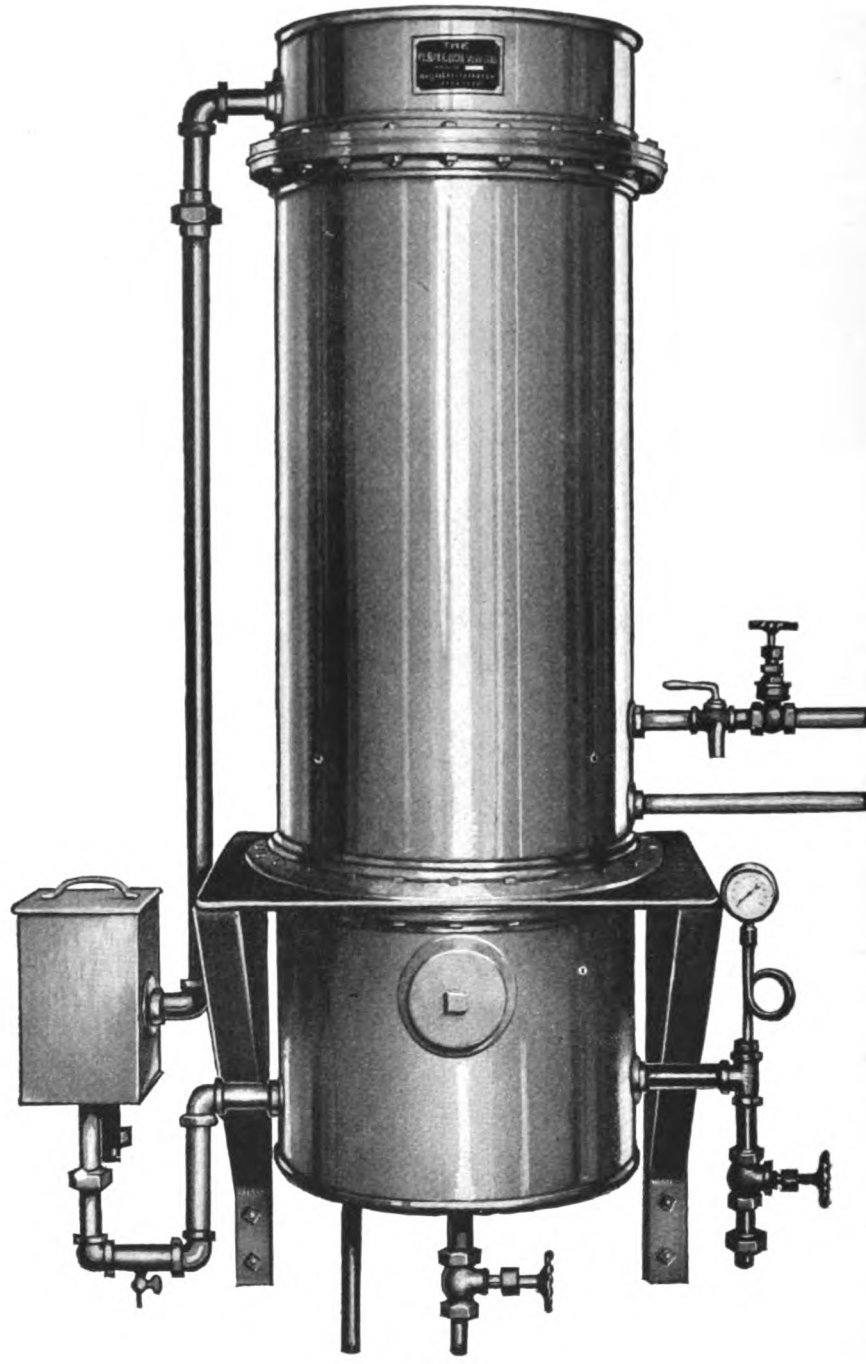
The Perfection Water Still

(Marine Type)



No. 25
(25 G. P. H.)

Sizes from 5 to 300 gallons per hour.

Built by

Perfection Equipment Co.

Market & 4th Sts. **St. Louis, Mo.**

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The Perfection Water Still

(*Marine Type*)

The **Perfection Water Still** (steam operated) is built of solid copper throughout, with pure block tin interiors and tinned brass flanges and fittings. The raw water to be distilled, the pure vapors and Distilled Water come in contact with no surface other than pure block tin.

The **Perfection Water Still** (steam operated) is shipped complete with all immediate pipes, valves and fittings, and is equipped with drain cocks, steam gauge and steam trap.

The **Perfection Water Still** (steam operated) is mounted on wall brackets, as shown in the illustration, or on a malleable iron floor stand, according to building conditions. These mountings are interchangeable. It is delivered ready for mounting and the making of steam, water and drain connections.

The **Boiling Head** is equipped with an oversize heating coil, made of cold drawn, seamless copper tubing. The steam from your boiler enters this heating coil at 50 lbs. pressure. The heating coil being submerged in the water of the Boiling Head raises the temperature of that water to 212 Deg. F. and converts it into a vapor, which passes into the Condenser. The steam in the heating coil, having been used to evaporate the water in the Boiling Head is condensed and drained from the coil by a steam trap.

Special attention is invited to the **Condenser**, which consists of a set of coils and not a tank. The Condensing Coils are made of cold drawn seamless copper tubing, tinned outside. These coils are self cleaning. All matter in suspension such as mud, etc., is carried on through the coils and finally discharged into the Boiling Head of the Still, whereas in a tank Condenser, this foreign matter settles to the bottom of the Condenser, reducing water space—thus lessening efficiency. It is a difficult matter to remove this accumulation of mud from a tank Condenser.

The raw water is admitted to these coils through the body of the Condenser, and in its use for condensing purposes it attains a temperature of between 180 and 200 Deg. F. At this temperature it is discharged into the Gas Dispelling Chamber, where, on account of its temperature it frees itself of all gases, air, free ammonia, carbon dioxide, chlorine, etc., including empyreumatic gases (gases arising from decaying animal and vegetable matter). These gases pass off through openings in the cover provided for that purpose.

The gas-free, hot raw water overflows from the Gas Dispelling Chamber into the Feed Box, from where such an amount as is necessary to keep the proper level, is introduced into the Boiling Head. This level is automatically and positively maintained.

The pure vapors arising from the Boiling Head passing into the Condenser, come in contact with the cold surface of the Condensing Coils and are condensed or collapsed back into a liquid—Pure Distilled Water.

One of the outstanding features of the **Perfection Water Still** is its accessibility for cleaning. All foreign matter contained in the raw water, both organic and inorganic, in suspension or solution is left behind by the pure vapors arising from the water of the Boiling Head, hence it accumulates in the Boiling Head and must be removed occasionally. This is the only cleaning operation necessary. It will be noticed that the Boiling Head is provided with a cleanout opening. There is a drain line with a valve in the exact center of the bottom of the Boiling Head. By opening this valve the water in the Boiling Head is drained off, then by the removal of the cover from the handhole cleanout, the heating coil and the entire interior of the Boiling Head may be inspected, and a stream of water from a hose introduced to flush off the coil and flush out the Boiling Head thus removing all residue from distillation. This requires but a few minutes time and leaves the entire apparatus perfectly clean. The condition of the raw water supply determines how often the still should be cleaned, under usual water conditions and where the still is run steadily (24 hours a day) it should be flushed out once a week, or after about 150 hours operation.

Under certain water conditions, it is found that scale will deposit on the copper heating coil, and while in some cases this may be flushed off with a stream of cold water while the coil is warm, in other cases it may be necessary to submerge it in a 25% muriatic acid solution to dissolve the scale.

It is not necessary to remove the steam coil to submerge it in a muriatic solution bath, because the entire Boiling Head is built of solid copper, and the muriatic solution may be delivered into the Boiling Head by simply pouring it into the Copper Feed Box from where it passes through the brass pipe feed line into the Boiling Head. To drain the muriatic solution from the Boiling Head, Feed Box and Feed Line, you open the drain valve and allow the solution to flow into a glass bottle or bottles to be used over again at some later time. Less than five minutes time is required to submerge the Heating Coil in a muriatic solution bath, and to drain off the solution. In some cases it may be necessary to allow the solution to remain over night in the Boiling Head in order that all the scale on the Steam Coil be dissolved.

Most steam operated Water Stills figure a steam pressure of 100 lbs. at the gauge on the still. In the **Perfection Water Still** (steam operated) we figure a steam pressure of 50 lbs. at the gauge on the still, because our heating coil has just twice the area as is used in other steam operated Water Stills.

There being no moving parts to the **Perfection Water Still** (steam operated) and being built of the above described materials, there is no wearout to it. When the **Perfection Water Still** has been in constant operation for twenty years it will be just as good and operate just as satisfactorily as the day it was installed — accidents, fires or mistreatment excepted.

The **Perfection Water Still** is sold under a positive guarantee to produce its full rated capacity of Distilled Water that will pass all tests for purity and sterility, and the highest type water for Drinking, Manufacturing and Technical purposes

It is designed particularly for *MARINE INSTALLATIONS.*

Full details with blue prints, terms of payment, etc., on application.

Built by

Perfection Equipment Co.

Market & 4th Sts. **St. Louis, Mo.**

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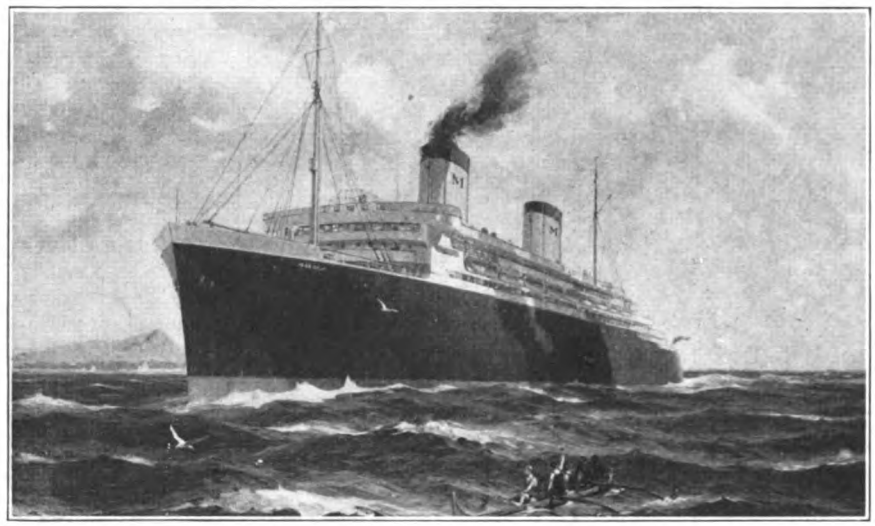
MALOLO—Passenger Ocean Liner—Twin Screw Steam



DESCRIPTION

An ocean liner meeting the recommendations of the conference for safety at sea, with twin screws driven by geared turbines of great power giving a speed of 21½ knots, and with spacious, comfortable and luxurious accommodations the MALOLO will be the equal of any transatlantic vessel. She will enter service between San Francisco and Hawaii about April, 1927.

Name—MALOLO.

Owner—American Hawaiian Steamship Co. Matson Navigation Co.

Builders—William Cramp & Sons S. & E. B. Co.

Naval Architects—Gibbs Bros. & W. A. Dobson.

Launched—About May, 1926.

Completed—About April, 1927.

Classification—American Bureau of Shipping and Lloyd's Register of Shipping.

HULL PARTICULARS

Length over all, 582 feet; length between perpendiculars, approximately 554 feet, which is also approximately Lloyd's length; breadth molded, 83 feet; depth molded to C deck, 54 feet; draft loaded, 28 feet 6 inches; displacement loaded, 22,050 tons; gross tonnage, about 17,200; net tonnage, about 8450; passenger capacity, 693 first-class; cargo capacity, 8250 tons, and in cubic feet, dry cargo 208,600, refrigerated cargo 18,600, stores 21,100; fresh water, 2200 tons; salt water ballast capacity, 1040 tons; bunker capacity, 4590 tons of fuel oil; speed, 21½ knots.

MACHINERY PARTICULARS

Main Engines—Two Parsons steam geared turbines under construction by Wm. Cramp & Sons Ship and Engine Building Co., each turbine, driving a single shaft, will have 12,500 shaft horsepower.

Boilers—Twelve water tube marine type Babcock & Wilcox make, forced draft; total heating surface, 56,000 square feet; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Worthington and Gould.
Windlass—Hyde Windlass Co.
Cargo Winches—Hyde Windlass Co.
Boat Winches—Diehl Mfg. Co. & Lidgerwood.
Steering Engine—Bethlehem S. B. Corp.
Anchor Chain—National Malleable Co.
Propellers—Wm. Cramp & Sons S. & E. B. Co.
Reduction Gears—DeLaval Steam Turb. Co.
Refrigeration—J. & E. Hall Co., Ltd.
Valves—Crane Co.
Oil Burning Equipment—Babcock & Wilcox.
Superheaters—Babcock & Wilcox.
Electric Generators—Westinghouse Electric.
Turbines—B. F. Sturtevant Co.
Heaters—B. F. Sturtevant Co.
Fans—B. F. Sturtevant Co.
Galley Equip.—Edison Elec. Appliance Co.
Gyro Compass & Gyro Pilot—Sperry.
Searchlight—Sperry.
Evaporator—Griscom-Russell Co.
Feed Water Heaters—Griscom-Russell Co.
Vehisote—The Pantasote Co. Inc.
Deck Windows—Kearfott Engineering Co.
Deck Covering—Marine Decking & Supply Co.
Flooring—Bonded Floors Co.

The MALOLO will make the run from San Francisco to Honolulu in less than four days. The steel structure of the vessel is in excess of the requirements of American bureau of shipping and Lloyd's register of shipping, with both of which societies the vessel is classed.

Passenger accommodations are unusually complete. There are 43 staterooms with one bed, 57 with two beds, 26 with one bed and one Pullman berth, and 8 de-luxe rooms with two Pullman berths, 146 with two beds and one berth. In addition there are 27 sofa berths which makes a total passenger accommodation of 690 in 280 staterooms. One hundred forty-five of these staterooms have private bathrooms. On two of the decks every stateroom is connected with a private bath or toilet.

The dining saloon extends the full width of the vessel and is 132 feet, 6 inches long and has a seating capacity at small tables of 496 persons. The galley and pantries and similar spaces are of exceptional completeness and are electrically equipped throughout.

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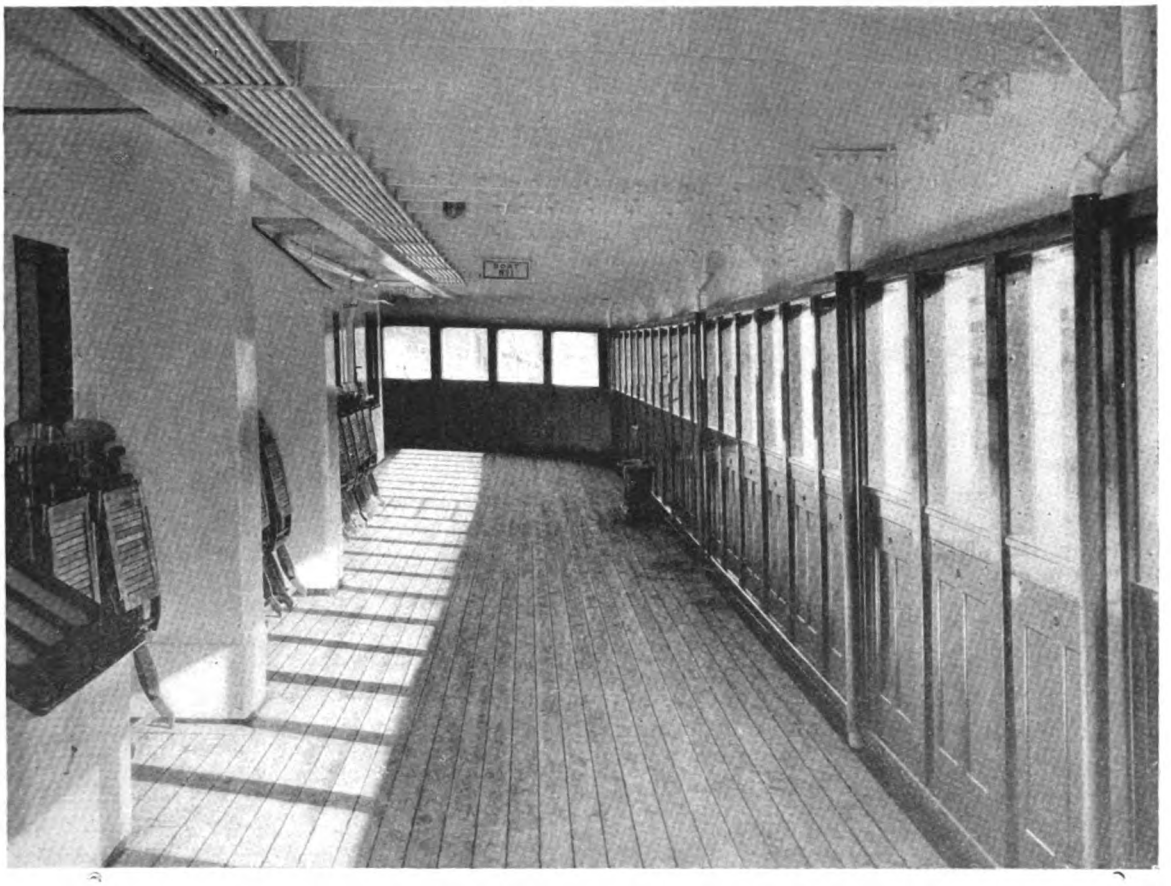
BECLAWAT

BALANCED FRAMELESS WINDOWS

For Deckhouses and Promenade Deck



Beclawat Promenade Deck Windows
S. S. COAMO

Recent installations

S.S. Mauretania	Cunard Line
S.S. Transylvania	" "
S.S. Scythia	" "
S.S. Corinthian	" "
S.S. Letitia	" "
S.S. Orizaba	Ward Line
S.S. Siboney	" "
S.S. Cherokee	Clyde Line
S.S. Seminole	" "
S.S. Mohawk	" "
S.S. Pres. Polk	Dollar Line
S.S. Coamo	N. Y. & P. R. Line
S.S. Malolo	Matson Line
S.S. Republic	United States Line

BECLAWAT equipment meets every requirement of the Malolo's specifications, and is chosen for deckhouse windows and promenade deck enclosure.

KEARFOTT ENGINEERING COMPANY, Inc.,
95 Liberty Street **New York, N.Y.**

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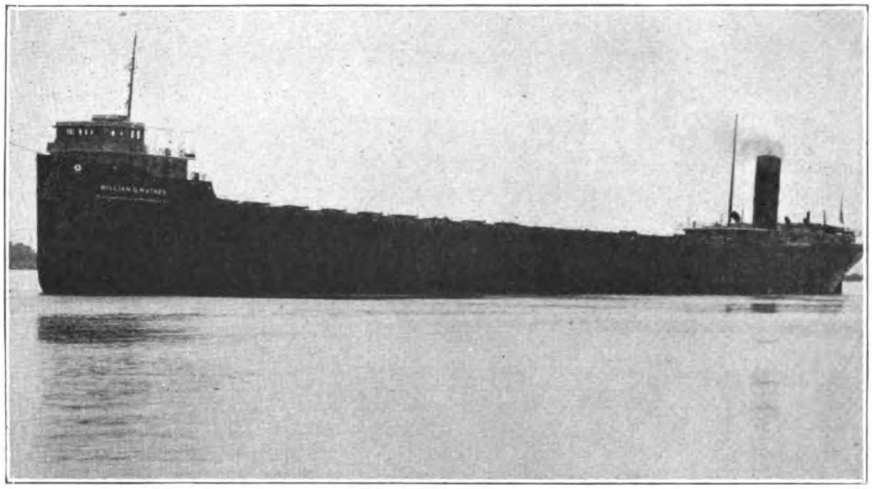
WILLIAM G. MATHER—Freighter—Great Lakes—Single Screw Steam



Name—WILLIAM G. MATHER.
Owner—Cleveland Cliffs Steamship Co.
Builder—Great Lakes Engineering Works.
Naval Architect—H. N. Herriman.
Launched—May 23, 1925.
Completed—July 25, 1925.
Classification—American Bureau.

HULL PARTICULARS

Length overall, 618 feet; length between perpendiculars, 592 feet; breadth molded, 62 feet; depth molded, 32 feet; draft loaded, 20 feet; displacement loaded, 20,070 tons of 2000 pounds each; gross tonnage, 8662; net tonnage, 6810; cargo capacity, 13,000 tons; cargo capacity, cubic feet, 599,000; bunker fuel capacity in tons of coal, 500; speed, 13 miles per hour.

MACHINERY PARTICULARS

Main Engine—One quadruple expansion reciprocating steam engine built by Great Lakes Engineering Works; size, 21¼ x 31 x 46½ x 68 inches and 42 inches stroke.

Boilers—Three Babcock & Wilcox, marine water tube boilers; size, 8,466 square feet of heating surface total; 210 square feet of grate surface; 846 square feet of superheating surface; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Kingsford, Dean.
Windlass—Hyde Windlass Co.
Mooring Machines—Hyde Windlass Co.
Steering Engine—American Shipbuilding Co.
Propeller—Great Lakes Engineering Works.
Refrigeration—Phoenix Ice Machine Co.
Superheaters—Babcock & Wilcox.
Electric Generator—American Blower engine, Crocker Wheeler generator.
Anchor Chain—National Malleable.
Soot Blowers—Diamond Power Specialty Corp.

The WILLIAM G. MATHER represents modern design for Great Lakes bulk freighters and is in several respects in advance of customary practice. For motive power a quadruple instead of the usual triple expansion reciprocating steam engine is used. The low pressure cylinder condenses into a properly sized surface condenser which, with radojet air pump, insures a maximum of vacuum thus using the steam economically. Steam is generated efficiently in water tube boilers of ample heating surface. Superheat is also applied adding to the efficiency. The boilers are fitted with induced draft, with efficient soot blowers and with feed water regulators. Coal, hand fired, is used for fuel. It may be noted from this description that the owners and builders and naval architect have kept an open mind to all suggestions for increasing economy of fuel consumption.

In hull construction the vessel follows customary Cleveland Cliffs practice of vertical side tanks and with the double bottom tank top carried to the sides of the ship, so that the sides tanks are quite independent of the double bottom. The main deck stringer is built at an angle for self-trimming. A walk 2 feet wide is fitted above the stringer for the length of the cargo hold. There are 18 hatches, 12 feet by 40 feet in the clear fitted with sliding plate hatch covers of the builder's own design. Single deck houses are located forward and aft, with roomy and comfortable accommodations for officers and crew in keeping with the best recent lake practice. The owner's quarters consist of six staterooms, with four bath rooms, a sitting room on the spar deck, an observation room in the texas and a kitchenette, all forward, and a private dining room in the after house.

Auxiliaries on deck consist of a steam windlass forward, six 8 x 10 inches mooring machines, two 6 x 6 inches double geared hatch engines, and a kedge anchor windlass aft.

DESCRIPTION

In machinery and hull construction, a fine example of the bulk freighter. Interior finish of quarters is also of the best. American walnut is used in the sitting room, observation room and captain's quarters. Staterooms are enameled, and the bath rooms are tiled. The private dining room is paneled in English oak.

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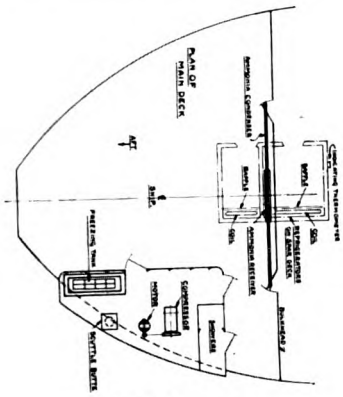
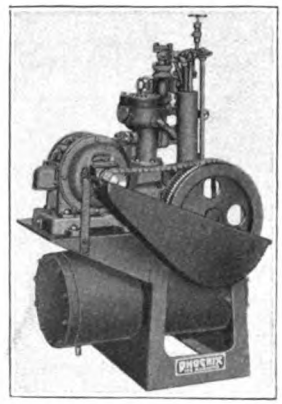
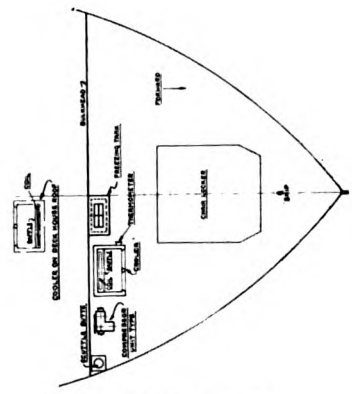


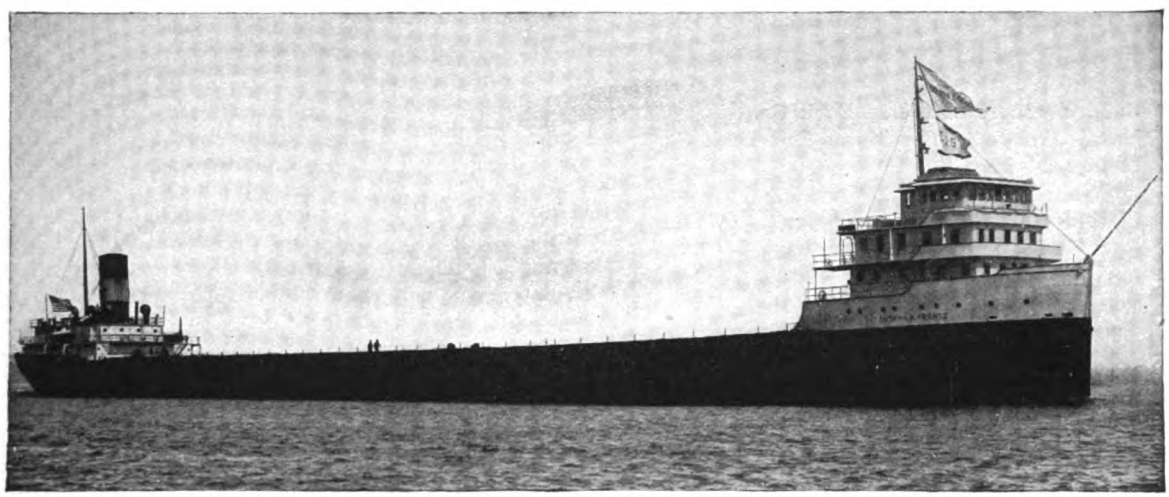
Aft Equipment



Phoenix Ice Machine



For'd Equipment



Steamer "JOSEPH H. FRANTZ", The Columbia Steamship Company

Equipped with 2 Phoenix Electric Driven Refrigerating Plants.

Aft Specification

Refrigerating Machine, Etc. A twin cylinder, vertical enclosed type, Phoenix Refrigerating Machine, securely fastened to main deck. Compressor is driven by a 115 volt electric motor. The fly wheel of compressor has teeth cut into it and chain drive between same and motor pinion is enclosed in a metal housing containing lubricating oil. Ammonia condenser is of the double pipe type, 50% over capacity. Condenser and ammonia receiver are suspended from the bulk head.

Automatic Control The refrigerating machine is equipped with an automatic control board. Thermostat is located in the refrigerator room. The refrigerating equipment will start and stop as the temperature of the room varies. An indicating thermometer with extension tube run into the cooler at all times shows the temperature without the necessity of opening the cooler doors.

Water Scuttle Butt A 15 gallon galvanized water scuttle butt, equipped with galvanized cooling coil, set in an insulated wooden matched board jacket.

Ice Tank A 200 lb. ice making set contained in a neat galvanized metal jacket, securely holds the cork insulation material around it as well as the tank top and covers for cans.

Refrigerator Room The refrigerator room is located on the Spar Deck and is 11' 6" x 8' 0" x 6' 0" high. It is divided in 2 rooms. One for vegetables, 6' 6" x 8' 0" x 6' 0" and the other for Meats, 4' 6" x 8' 0" x 6' 0". The rooms are piped with 1¼" extra heavy refrigerating pipes so as to maintain an average temperature of 45 and 36 degrees respectively.

Forward Specification

Unit Type Refrigerating Equipment The refrigerating equipment is of one ton capacity. The outstanding feature being the new Unit Type Construction. Compressor is the 2 cylinder type, vertical, enclosed and self oiling. It is mounted on a heavy cast iron base together with its electric motor. The equipment is chain driven totally enclosed. A combination ammonia receiver and condenser rests in the base of compressor. The total floor space required is only 35" x 35".

Automatic Control The refrigerating machine is equipped with an automatic control board. Thermostat is located in the refrigerator room. The refrigerating equipment will start and stop as the temperature of the room varies. An indicating thermometer with extension tube run into the cooler at all times shows the temperature without the necessity of opening the cooler doors.

Water Scuttle Butt A 15 gallon galvanized water scuttle butt, equipped with galvanized cooling coil, set in an insulated wooden matched board jacket.

Ice Set A 100 lb. ice set contained in a neat galvanized metal jacket securely holds the cork insulation material around it as well as the tank top and covers for cans.

Refrigerator Rooms A 5' x 2' 10" x 5' 10" refrigerator is located on Deck House Roof.
A 5' x 2' 10" x 5' 10" refrigerator is located on same deck with ice machine.
Both coolers are piped with 1¼" extra heavy pipe coils of proper amount to secure desired temperatures.

The Phoenix Ice Machine Co.

FACTORY OFFICES - - Aust and W. 28th St., Cleveland—137 N. Erie, Toledo
SERVICE POINTS - - - - 3060 Michigan Ave., Detroit—Ford Bros.—Buffalo

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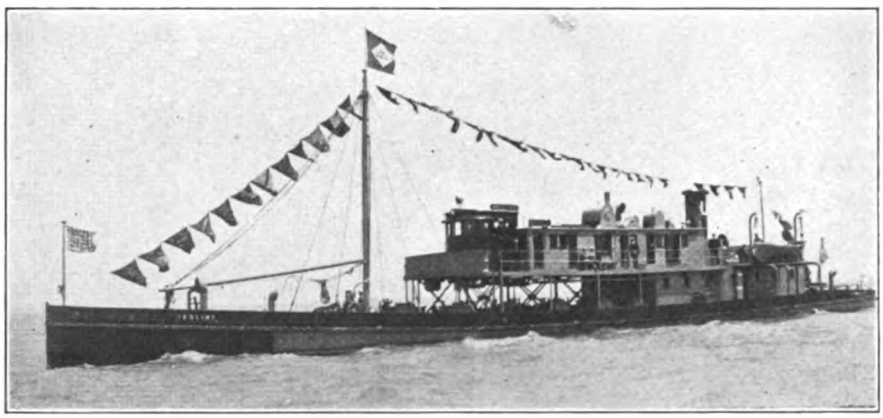
REDLINE—Tanker—Twin Screw-Diesel



DESCRIPTION

The Union Oil tanker REDLINE was built in 1925 by the Moore Dry Dock Co. for service on the Sacramento river and San Francisco bay and is one of the most modern vessels of her type. Propelled by twin screws with direct-connected diesel engines and of shallow draft.

Name—REDLINE.
Owner—Union Oil Co.
Builder—The Moore Dry Dock Co.
Naval Architect—The Moore Dry Dock Co.
Launched—May 28, 1925.
Completed—June 23, 1925.
Classification—American Bureau + A-1 E.

HULL PARTICULARS

Length overall, 175 feet 9 inches; length between perpendiculars, 175 feet; breadth molded, 36 feet; depth molded, 7 feet; draft loaded, 5 feet 6 inches; displacement loaded, 751 tons; gross tonnage, 389; net tonnage, 223; cargo capacity, 150,000 gallons of oil; bunker fuel oil capacity in tons, 8; speed, 8 knots.

MACHINERY PARTICULARS

Main Engines—Two 4 cylinder 4 cycle diesels, built by Western Machinery Co., each of 165 horsepower at 280 revolutions per minute.

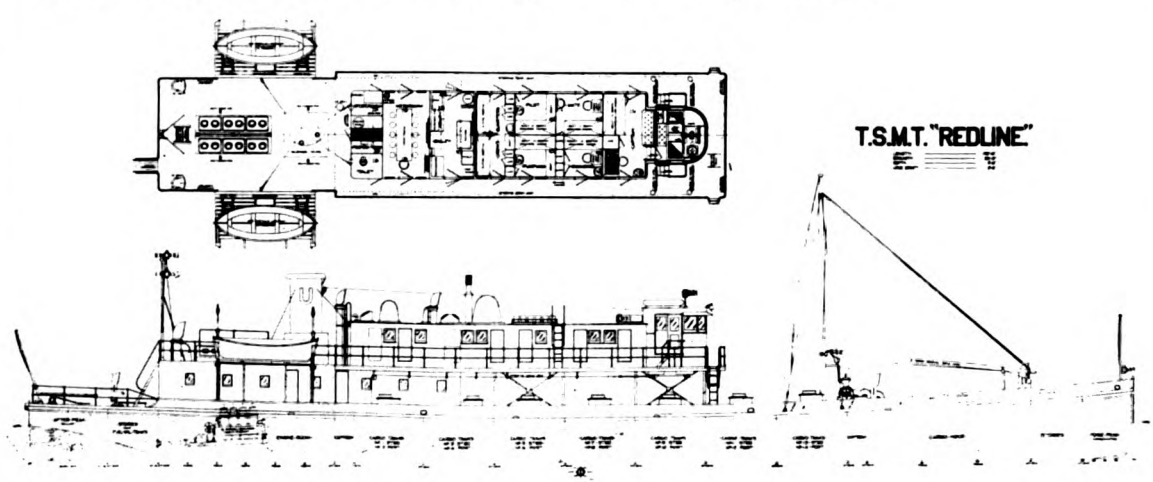
AUXILIARY EQUIPMENT

Manufacturers of:

Auxiliary Eng.—Pumping eng., 110 brake horsepower, 3 cylinder vertical, Western.
Pumps—Northern Pump Co.
Winches—Enterprise, double drum.
Steering Engine—Hand and air combined.
Propellers—The Moore Dry Dock Co.
Electric Generator—Fairbanks-Morse, 6 h. p.
Framing—Isherwood System.

Both the owners and the builders take a proper pride in the standard of perfection in design and construction of the tanker REDLINE. This vessel with her equipment, machinery and outfit is classed under special survey of the American bureau of shipping. Three balanced rudders are fitted, one on the center line of the ship, and the outboard rudders which can be unshipped for the drawing of the tail shafts are in line with the propellers. The hull is divided into 14 oil tanks with a combined capacity of 150,000 gallons. Cofferdams separate the oil cargo spaces from the engine room. There is an expansion hatch 30 inches high over each oil tank allowing for 2 per cent expansion.

The propelling machinery, the lighting set and all necessary auxiliaries are located aft. The pump room is on the upper deck at the after end of the oil space. Eight tons of fuel oil sufficient for 135 hours continuous running is carried. The propellers are of solid manganese bronze and have three blades. The cargo pumping engine is a 3-cylinder vertical Western diesel engine with two flywheels, delivering 100 horsepower at 300 revolutions per minute.



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Two De Laval Vapor-Tight Fuel Oil Purifiers installed on the Ford Motor Company's *M.S. East Indian.*

Clean oil *on the* M. S. East Indian

One important part of the Sun-Doxford Diesel conversion installation of the Ford Motor Company's ship *East Indian* is the De Laval centrifugal equipment for cleaning the fuel and lubricating oils. This vessel has been fitted with four De Laval Purifiers, two vapor-tight models for the fuel oil and two of the standard type for lubricating oil.

The De Laval Vapor-Tight Fuel Oil Purifier is built especially for this service as its name denotes. It has closed flexible hose connections with quick-opening unions at inlet and outlet points and gasketed cast aluminum covers. This construction makes the machine vapor-tight, so that it is entirely safe to purify the oil while at a temperature higher than its flash-point, as is often necessary in burning low-gravity oils.

Clean fuel oil minimizes wear on cylinder liners, injection nozzles and fuel pumps, and removes the trouble attending the burning of oil containing water. Regardless of its previous condition, oil which comes from the De Laval Purifier is *clean.*

THE DE LAVAL SEPARATOR COMPANY

165 Broadway, New York — DE LAVAL PACIFIC COMPANY, San Francisco — 600 Jackson Blvd., Chicago

De Laval Oil Purifiers

Please send Bulletin containing further information regarding the De Laval Purifier as checked below:

[ ] Purification of lubricating oil.

[ ] Purification of fuel oil.

Name .....

Company ..... M. R. 5591

Address .....

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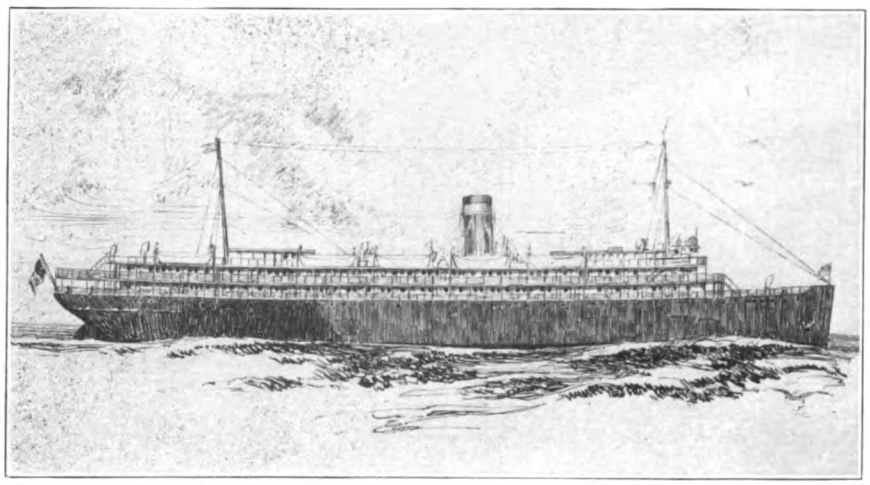
CHATHAM—Passenger—Ocean—Single Screw Steam



DESCRIPTION

The CHATHAM is the first of three combination cargo and passenger vessels for the Merchants & Miners Transportation Co. These vessels are practically duplicates of the BERKSHIRE and ALLEGHENY completed in 1923. They are very comfortable and attractive ships and were especially designed for the coastwise service of the company.

Name—CHATHAM.
Owners—Merchants & Miners Transp. Co.
Builder—Newport News S. B. & D. D. Co.
Naval Architect—Merchants & Miners Transp.
Launched—January, 1926
Completed—Under construction
Sister Ships—DORCHESTER and FAIRFAX; the DORCHESTER was launched on March 20.
Classification—American bureau of shipping

HULL PARTICULARS

Length overall, 368 feet; length between perpendiculars, 350 feet; breadth molded, 52 feet; depth molded to hurricane deck, 36 feet; draft loaded, 19 feet; displacement loaded, 6930 tons; gross register tonnage, 5486; net register tonnage, 3261; passenger capacity, 285 first class, 30 second class; cargo capacity cubic feet, 269,000; bunker fuel oil capacity in tons, 360 plus 210 in reserve; speed, 12 knots.

MACHINERY PARTICULARS

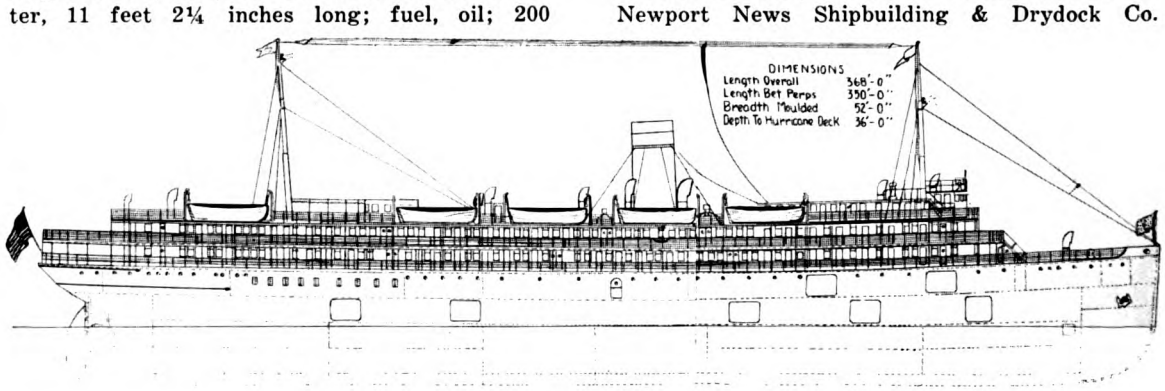
Main Engine—One reciprocating steam engine built by Newport News Shipbuilding & Drydock Co.; type, triple expansion 4 cylinders 24½ x 41½ x 54 x 54 inches and 48-inch stroke; indicated horsepower, 2700 at 81 revolutions per minute.

Boilers—Number 4; name of maker, Newport News Shipbuilding & Drydock Co.; type, Scotch single ended; size, 14 feet 3 inches in diameter, 11 feet 2¼ inches long; fuel, oil; 200 pounds per square inch working pressure. The boilers are so designed that conversion to burn coal can readily be made if advisable.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington Pump & Mach. Co.
Windlass—Hyde Windlass Co.
Winches—10, Lidgerwood Mfg. Co.
Boat Hoists—American Engineering Co.
Steering Engine—Hyde Windlass Co.
Propellers—Newport News S. B. & D. D. Co.
Refrigeration—Brunswick-Kroeschell Co.
Oil Burning Equipment—Todd Oil Burner
Electric Generators—Terry Steam Turbine Co. and Mathews Eng. Co.
Feed Water Heaters—Griscom-Russell Co.
Fuel Oil Heaters—Griscom-Russell Co.
Framing—Isherwood System
Vehisote—The Pantasote Co.
Electric Motors—Diehl Manufacturing Co.
Plywood-Pymetal—Haskelite
Lighting Sets—Kearfott Eng. Co.
Cabin Windows—Kearfott Eng. Co.
Blower—B. F. Sturtevant Co.

The CHATHAM, DORCHESTER and FAIRFAX, sister ships for the Merchants & Miners Transportation Co., for their service between Boston, Baltimore, Philadelphia, Norfolk, Savannah and Jacksonville, are under construction at the Newport News Shipbuilding & Drydock Co.



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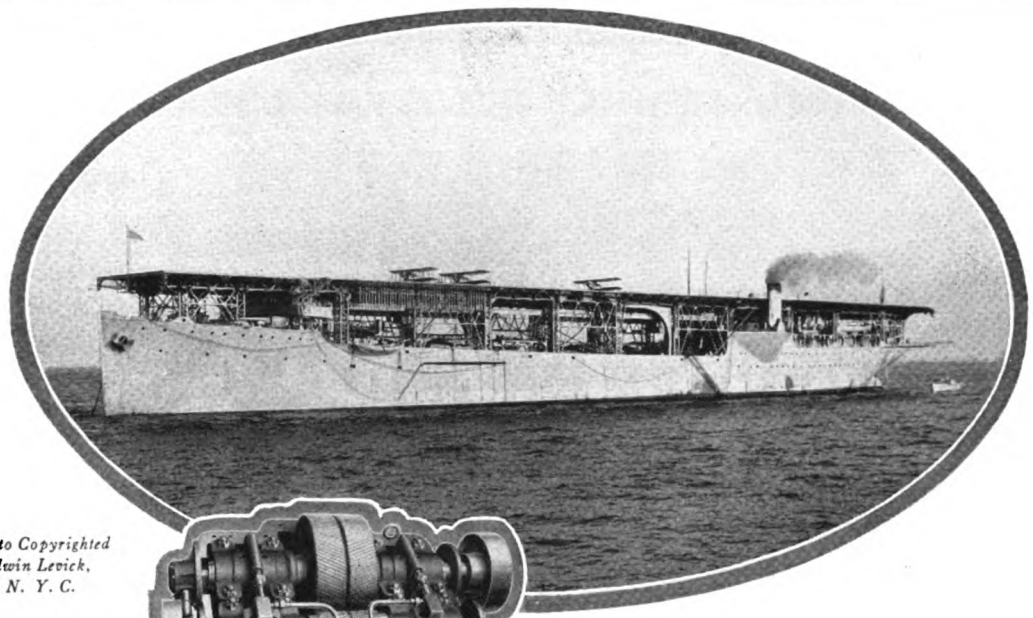

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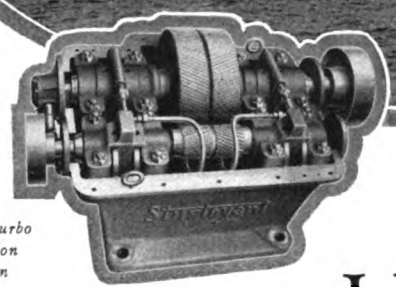
U. S. S. Langley



Sturtevant Turbo Transmission Mechanism

U. S. S. Langley Sturtevant Equipped

Aboard the airplane carrier, the U. S. S. Langley may be seen a unique installation of induced draft equipment. Two Sturtevant Turbo Transmissions driving two Sturtevant Induced Draft Fans, (each fan handling 60,000 cubic feet of gases a minute at 700° F.) are giving great satisfaction under all conditions. Each turbo transmission is operating under 150 lbs. steam pressure at 3000 r.p.m. on the pinion and 300 r.p.m. on the gear, developing 20 H.P.

Sturtevant Turbo Transmissions are ideal for driving fans, pumps, and other apparatus on ships where the high turbine speed is desirable and when the speed of the driven member is too low for direct connection to a turbine.

Sturtevant Turbo Transmissions are thoroughly dependable in every respect. They consist of a reduction gear transmission built integral with a turbine. The turbine casing is supported by the gear transmission base and the turbine rotor is carried on the high speed shaft.

This construction constitutes a steam turbine driven speed reduction unit especially commendable for its compactness, ease of installation and rigidity.

B. F. STURTEVANT COMPANY

Sales Engineering Offices

Atlanta, Ga.	Los Angeles, Cal.
Boston, Mass.	Montreal, P. Q.
Buffalo, N. Y.	New York City
Camden, N. J.	Pittsburgh, Pa.
Chicago, Ill.	Portland, Ore.
Cincinnati, Ohio	Rochester, N. Y.
Cleveland, Ohio	St. Louis, Mo.
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Plants Located at

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Sturtevant
PUTS AIR TO WORK

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American Trading Co.	Tokio
American Trading Co.	Shanghai
Catton Neill Eng. & Mach. Co.	Manila
H. P. Gregory & Co., Ltd.	Sydney
Blair, Reed & Co., Ltd.	Wellington
Wesselhoeft and Poor	Caracas
Wesselhoeft and Poor	Bogota
General Machinery Co.	Tampico
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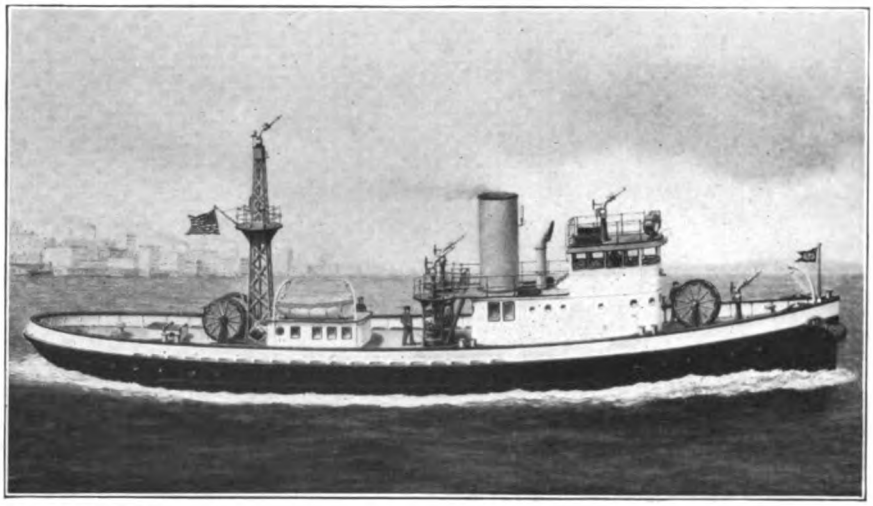
PORT HOUSTON—Fireboat—Twin Screw—Diesel—Electric



DESCRIPTION

An all steel diesel electric twin screw municipal fire boat for service at Port of Houston, Texas. The design is based on an extensive investigation of the entire subject of efficient fire fighting by marine units. Utmost flexibility and power manipulation is possible, combined with the economy of the diesel engine.

Name—PORT HOUSTON.
Owner—Port of Houston, Texas.
Builder—Beth. S. B. Corp., Harlan Plant.
Naval Architects—Cox & Stevens.
Launched—Feb. 16, 1926.
Completed—Under construction.
Classification—Not classified. Materials equal to requirements, American bureau of shipping.

HULL PARTICULARS

Length over all, 125 feet 10 inches; length on load water line, forward part of stern to aft side of stern post, 117 feet 6 inches; breadth molded, 27 feet; depth molded amidships, 14 feet; draft, 8 feet 6 inches; speed, 12 knots.

MACHINERY PARTICULARS

Main Engines—Two Winton Engine Co. 6 cylinder full diesels, 450 brake horsepower each at 400 revolutions per mniute.

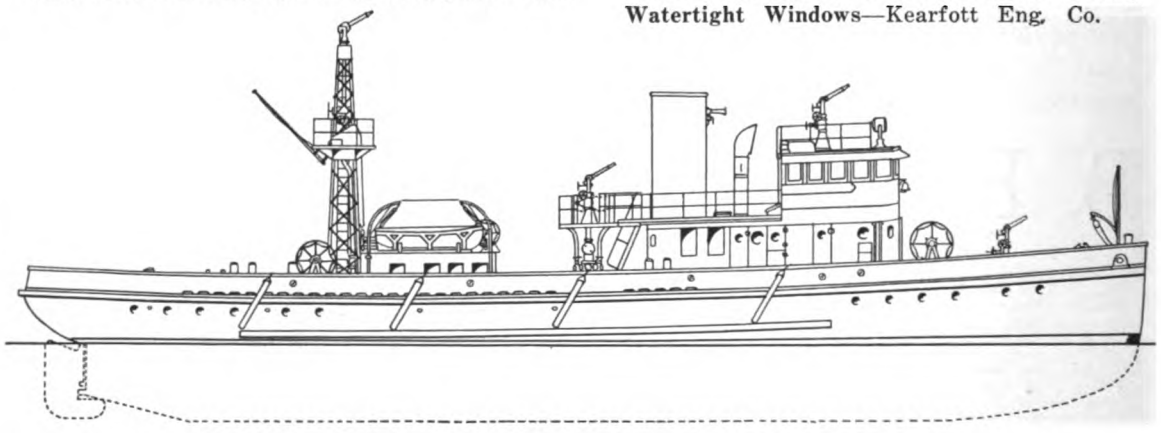
Main Generators—Two 115-G Westinghouse Electric & Mfg. Co., 350 kilowatts each, 500 volts direct current at 400 revolutions per minute; two exciters, 25 kilowatts, 125 volts direct current at 400 revolutions per minute; two single armature main propulsion motors, 500 volts direct current, 360 shaft horsepower each at 265 revolutions per minute.

Main Fire Pumps—Two Worthington pumps each direct connected to a Westinghouse 410 horsepower, 500 volts direct current motor; size, 3500 gallons per minute each, against 150 pounds pressure at 1750 revolutions per minute.

The 25 kilowatt, 125 volt exciters can instantly be switched by the Ward-Leonard system of pilot house and engine room control from the two 360 horsepower 500 volt, single armature propulsion motors to the two 410 horsepower 500 volt fire pump motors, or the power can be divided between the propulsion and pump motors or any one or all of the motors can be disconnected from the power circuit. The revolution of the propulsion motors can be varied and held in any speed, driving the propellers from 0 to 265 revolutions per minute in either direction.

AUXILIARY EQUIPMENT

Manufacturers of:
Auxiliary Generator—Winton & Westinghouse.
Electric Capstans—Two, American Eng. Co.
Steering Engine—American Engineering Co.
Propellers—Beth. S. B. Corp., Harlan plant.
Electric Generators—Westinghouse E. & Mfg.
Watertight Windows—Kearfott Eng. Co.



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America's Finest Diesel Vessels

are powered with

WINTON ENGINES

CAPTAIN TALFOR

P. R. R. No. 16

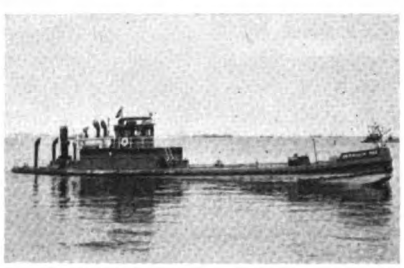
A. G. LAUN

ARTHUR N. HERRON

D. M. RENTON

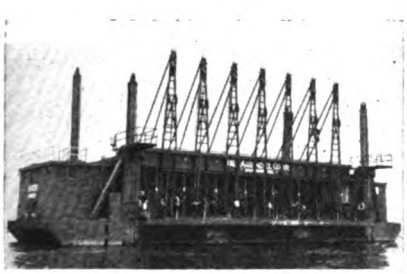
ATLAS

DAVID P. FLEMING

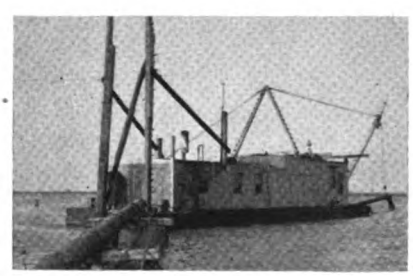


PETROLIA No. 6

S. O. CO. No. 7



ARUNDEL BARGE



BLACK DIAMOND

J. B. BATTLE

THE WINTON ENGINE COMPANY, Cleveland, Ohio, U. S. A.

New York—A. G. Griese, Inc., 331 Madison Ave.
Los Angeles—F. G. Bryant, 201 F. W. Braun Bldg.
Boston—Walter H. Moreton Corporation, 780 Commonwealth Ave.
New Orleans, La.—Warren C. Graham Co., 411 Godchaux Bldg.
Washington—R. L. Fryer, 430 Transportation Bldg.
Seattle—J. O. Larsen, 19 Colman Dock
Cleveland—F. C. Erdman Co., Union Trust Bldg.

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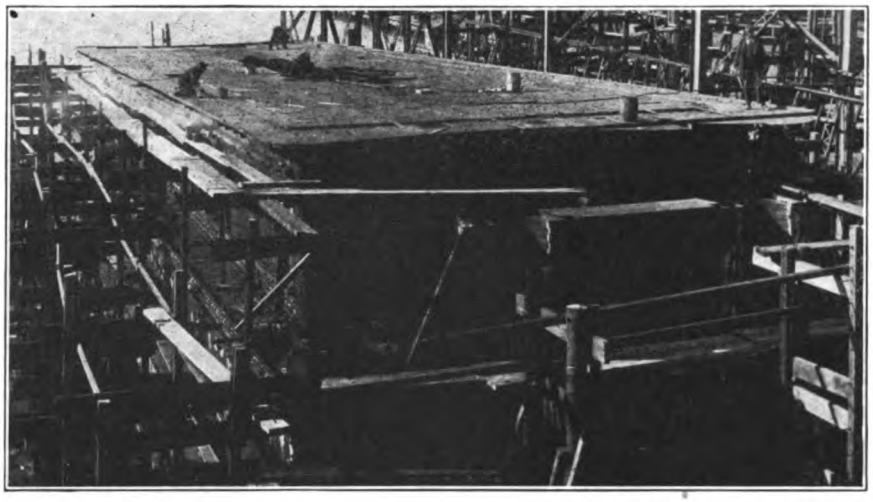
RAYMOND—Pipe Line Dredge—Diesel



Name—RAYMOND.
Owner—United States Engineers.
Builder—Newport News S. B. & D. D. Co.
Naval Architect—United States Engineers
Launched—March 20, 1926
Completed—Under construction
Classification—None

HULL PARTICULARS

Length overall, 235 feet 4½ inches; length between perpendiculars, 177 feet 6 inches; breadth molded, 40 feet; depth molded, 14 feet 8 inches; draft estimated, 9 feet 8 inches maximum; crew, 8 officers 41 men; oil bunker capacity, 126 tons; displacement estimated, 2000 tons maximum; fresh water, approximately 50 tons.

MACHINERY PARTICULARS

Main Pumping Engine—One McIntosh & Seymour 10-cylinder 4-cycle single acting, air injection diesel engine, 17-inch bore x 24-inch stroke, of 110 brake horsepower at 210 revolutions per minute. This diesel engine is direct-connected to a dredging pump of 20 inches diameter. There are two diesel electric generating sets with output of 585 kilowatts at 230 volts direct current of General Electric make.

AUXILIARY EQUIPMENT

Manufacturers of:

Cutter Motor—200 b. h. p. General Electric.
Pumps—Worthington and Northern Pump Co.
Winches—Hyde Windlass Co.
Refrigeration—Remington Machine Co.
Electric Generators—Worthington and G. E.
Motor Generators—General Electric

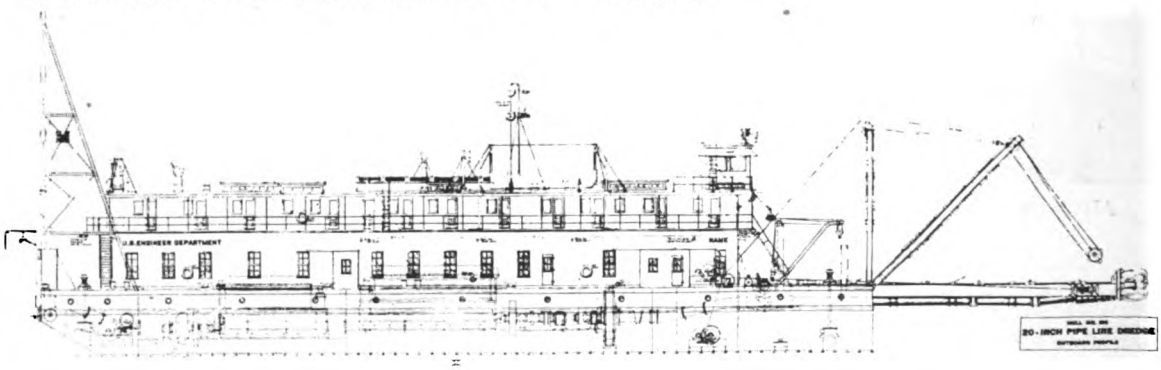
The dredging pump runner shaft is fitted with a Kingsbury thrust and sleeve steady bearing. A flexible coupling is fitted next to the engine and is capable of transmitting 1100 brake horsepower at the rated engine speed. In addition to supplying current for all auxiliary machinery the two diesel electric sets supply current to a motor-generator set which furnishes power for the booster pump motor.

An exhaust gas steam generator is installed for providing steam for heating the quarters and heating fuel oil. In addition to the main engines there is also a 120 brake horsepower oil engine direct-connected to a direct current generator of 85-kilowatt capacity and a similar engine connected to a 10-kilowatt lighting generator.

The hull and main deck house are of steel and the upper and operating houses are of wood. Quarters are provided for crews for three shifts of eight hours each. A number of changes have been made in the dredge during construction and these are included in the above description.

DESCRIPTION

The RAYMOND is a 20-inch pipe line dredge constructed for operation on the Delaware river as a rehandling machine. This dredge will handle material through 10,000 to 12,000 feet of pipe with a booster pump placed midway of the line. Three diesel engines, one direct-connected to the dredging pump and two direct-connected to the direct current generators.



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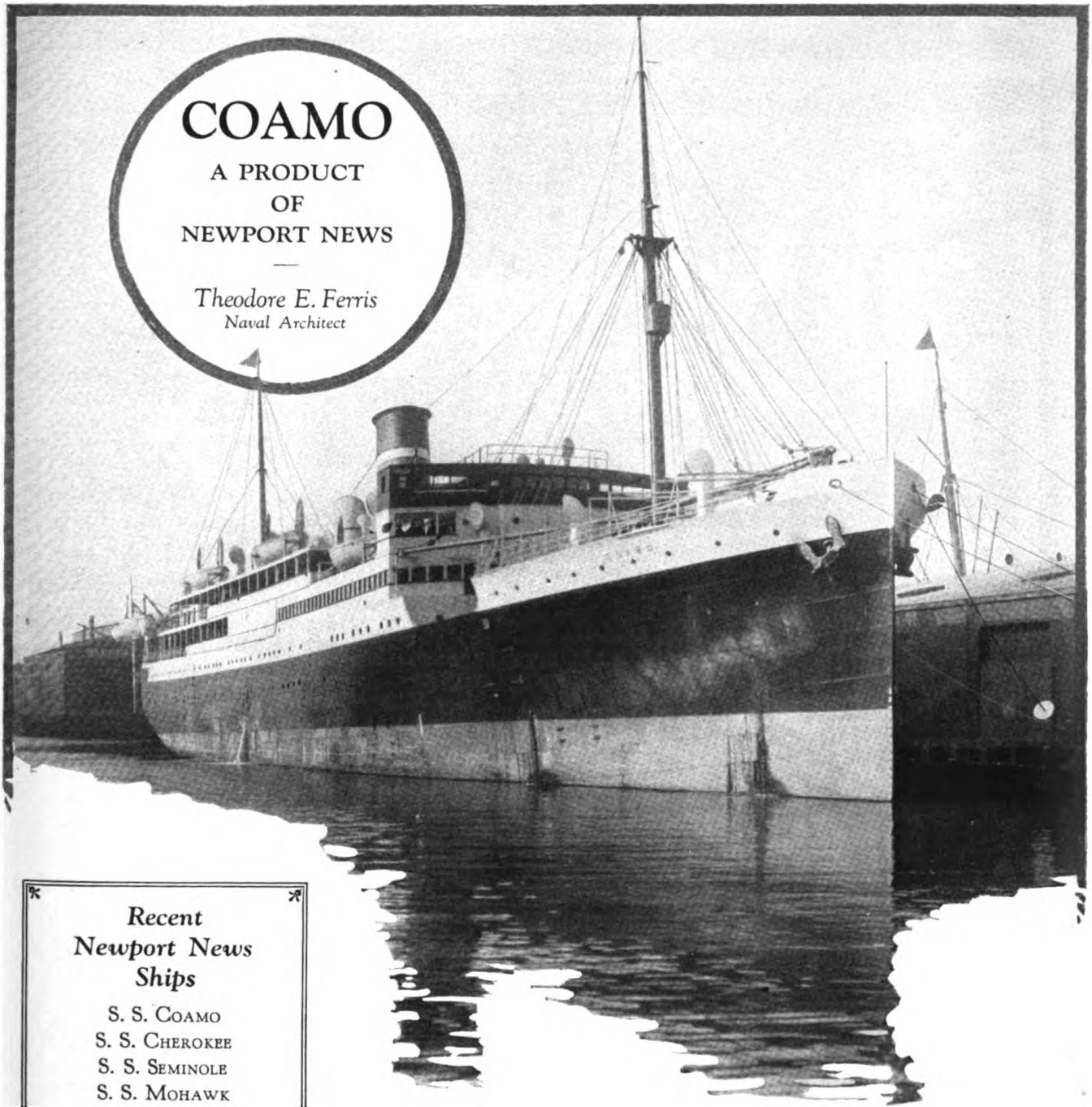

Recent Newport News Ships

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S. S. SEMINOLE
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S. S. CHATHAM
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S. S. FAIRFAX
S. S. ROBERT E. LEE
S. S. GEORGE WASHINGTON
S. S. CITY OF CHATANOOGA
S. S. CITY OF BIRMINGHAM
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YACHT OHIO
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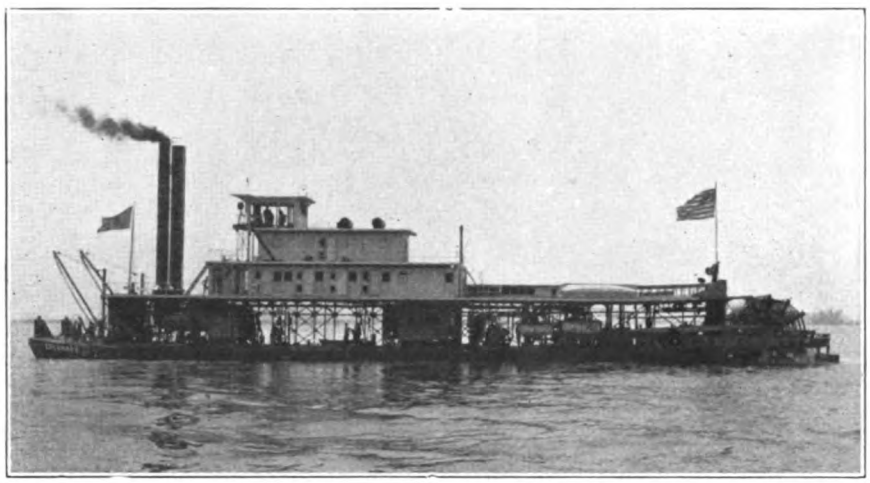
COLORADO—Stern Wheel—Shallow Draft—Steamer



DESCRIPTION

This vessel is of the stern wheel shallow draft type and is intended for service on the Magdalena river, Colombo, S. A. The vessel was towed to her destination. American experience with shallow draft boats for Mississippi and Ohio river service was found valuable in building this vessel.

Name—COLORADO.
Owner—Andian National Corp.
Builder—Sun Shipbuilding & D. D. Co.
Naval Architect—John W. Hudson.
Classification—None.

HULL PARTICULARS

Length over all, 194 feet 10¾ inches; length between perpendiculars, 166 feet; depth molded, 5 feet; draft, 3 feet 6 inches; gross tonnage, 443; net tonnage, 380; cargo capacity, 502 tons; cargo capacity cubic feet, 18,800; bunker fuel capacity in tons, 258; speed, 5 knots towing.

MACHINERY PARTICULARS

Main Engines—Two compound tandem condensing horizontal engines, built by Marietta Mfg. Co., size, 13 x 26 inches x 84-inch stroke, 22 to 26 revolutions per minute.

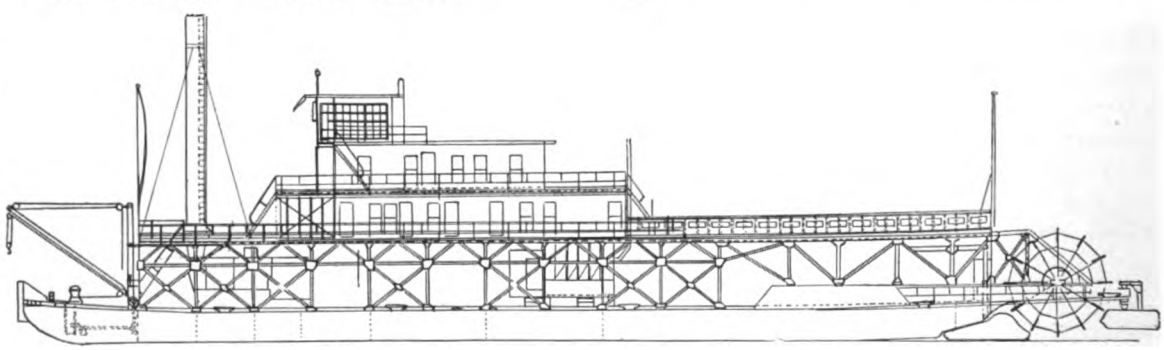
Boilers—Two locomotive type, size 6 feet x 22 feet, built by American Locomotive Co.; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—National, Worthington and Morris.
Capstans—Marietta Mfg. Co.
Steering Engine—Gardner & Co.
Propellers—Paddle wheels.
Refrigeration—Brunswick-Kroeschell.
Oil Burning Equipment—Staples & Pfeiffer.
Electric Generators—General Electric.

The stern wheel steamer COLORADO was completed at the plant of the Sun Shipbuilding & Dry Dock Co. last August. A steel stern wheel shallow draft vessel unique in construction and probably the first of its type to be built on the Delaware, at least in many years. She was built to the order of the International Petroleum Co. of Canada for use on the Magdalena river in South America.

The hull is divided into seven compartments which are so arranged that either bulk oil or water ballast may be carried on either side of the center line bulkhead. In addition to the center line bulkhead there are continuous longitudinal truss members on each side extending for the full length of the vessel. There are three main rudders and two auxiliary rudders to provide easy steering in shallow waters. Forward the vessel has been given extra strength by the installation of rugged knees. This is to take the shocks in service in pushing barges. On the main deck forward, are two oil burning locomotive boilers built by the American Locomotive Co. These boilers have a working pressure of 225 pounds and a heating surface of 1300 square feet each. Located aft of the boilers are the cold storage rooms, galley, auxiliary machinery, refrigerating machinery and dynamos.



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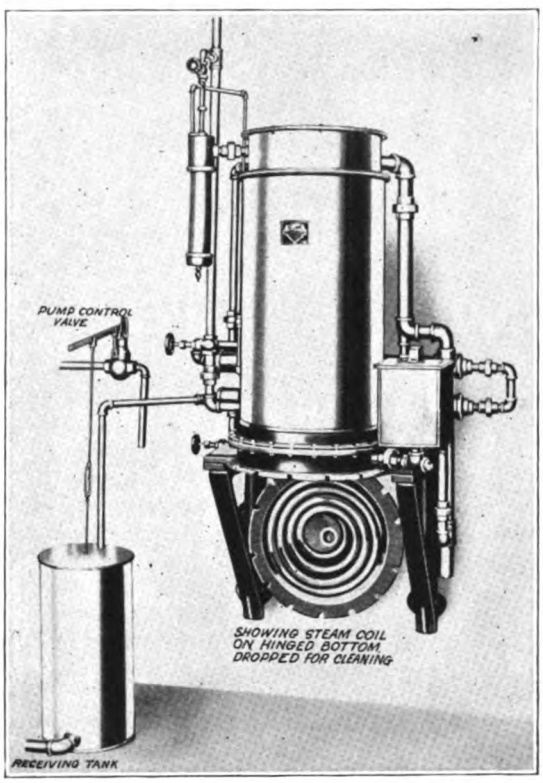

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No. 2 "	25-40 " " "		No. 5 "	100-150 " " "	

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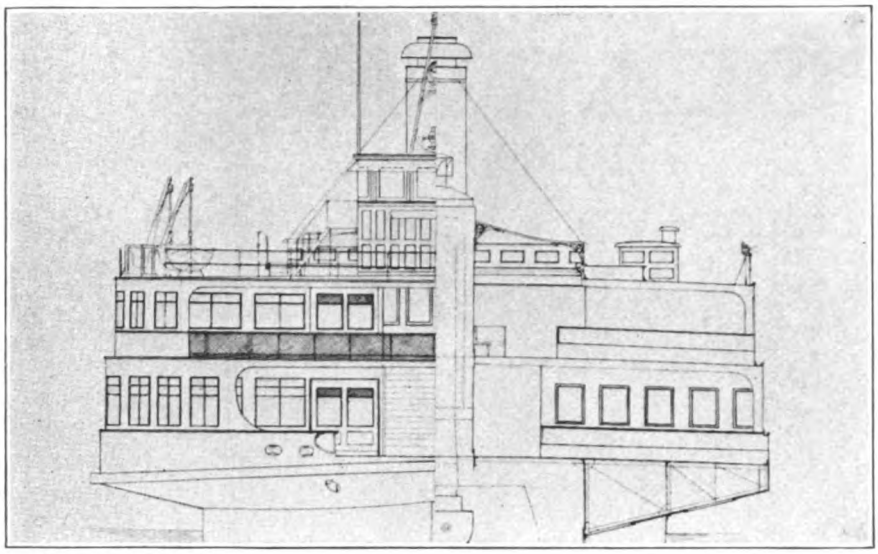
HULL Nos. 170 and 171—Ferry—Double Ended—Turbo—Electric



DESCRIPTION

It is interesting to know that the turbo-electric form of propulsion was chosen for these two fine ferry boats on account of its inherent reliability as demonstrated to the satisfaction of the public and the owner for a period of two years. Similar satisfactory performance is expected from these new boats. They will be used for service between the East bay and San Francisco.

Name—HULL NOS. 170 and 171. Key System.
Owner—Key System Transit Co., Oakland.
Builder—Moore Dry Dock Co.
Naval Architects—Hibbs, McCauley & Smith.
Launched—Under construction.
Classification—Highest in American Bureau.

HULL PARTICULARS

Length overall, 276 feet; length between perpendiculars, 256 feet; breadth molded, 47 feet; depth molded, 21 feet; draft normal load, keel, 14 feet 9½ inches; displacement loaded, 2015 tons; passenger capacity, 4000; deadweight capacity, 261 tons; normal fuel oil capacity, 114 tons; speed, 15 knots.

MACHINERY PARTICULARS

Main Engine—One Westinghouse Elec. & Mfg. Co. turbine of 3500 horsepower.

Main Generator—One Westinghouse D. C. generator, geared to main turbine, of 2100 kilowatt at 514 revolutions per minute; one exciter.

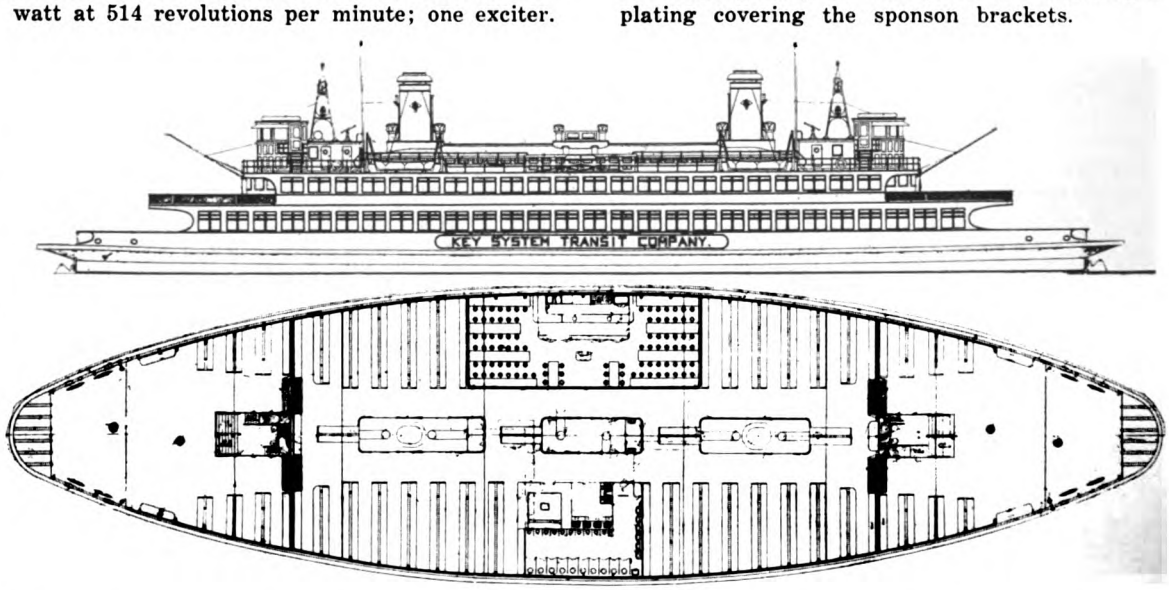
Motors—Two Westinghouse double armature D. C. propelling motors at 2600 horsepower total at 212 revolutions per minute.

Boilers—Four Babcock & Wilcox water tube marine boilers of 2837 square feet heating surface each; superheat; fuel, oil.

AUXILIARY EQUIPMENT

Manufacturers of:
Oil Burning Equipment—Babcock & Wilcox.
Superheaters—Babcock & Wilcox.
Electric Generators—Westinghouse Elec. Co.
Other equipment not yet announced.

Steel is used in construction throughout, wood appearing only in the teak passenger seats and in the teak pilot houses. The hull is divided into seven major watertight compartments by means of six major athwartship watertight bulkheads. An unusual feature contributing greatly to safety is the watertight plating covering the sponson brackets.



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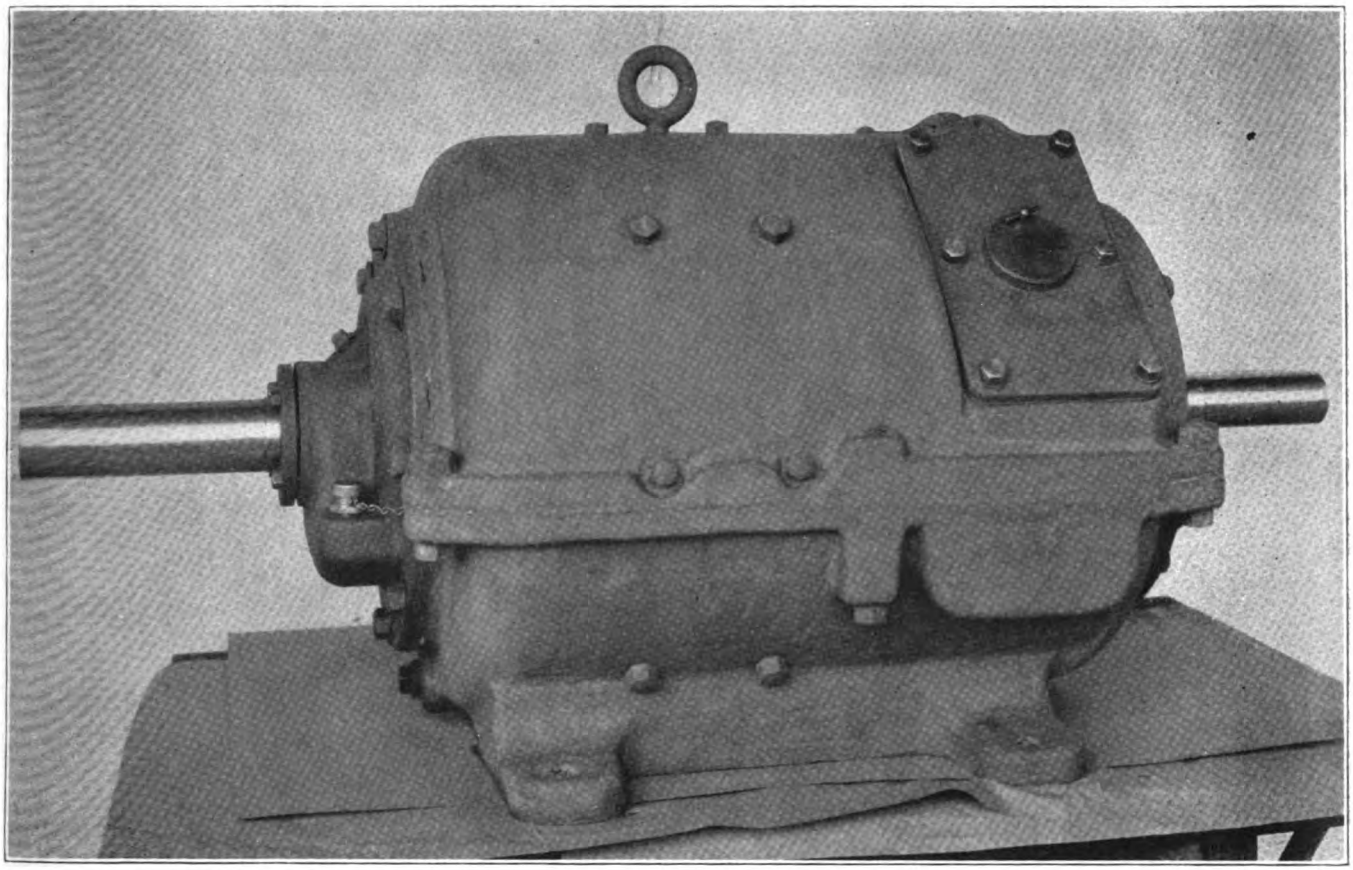

Mechanical Gear being built by Lidgerwood Manufacturing Company, New York, N. Y.
Electric Motors by Diehl Manufacturing Company, Elizabeth, N. J.
Controllers and Brakes by the Cutler-Hammer Manufacturing Company, Milwaukee, Wis.

Matson Liner "Malolo" Electric Boat Hoists

HOIST The hoist has two winch-heads, disposed one on each side of the winch for handling the two falls from the boat davits. The winch-heads are connected to the motor through double spur gearing entirely enclosed. The hoisting duty is 3000 pounds at 200 feet per minute.

MOTOR DIEHL type TD, split frame, watertight, 20 HP, reversible, compound wound, with frame and end covers of steel and bronze. Watertight sight windows for observing the operation without removing the covers. Double shaft extension, one end carrying pinion for driving hoist, the other end carrying brake wheel for Cutler-Hammer 10″ watertight shoe brake. Watertight bearings sealed by gland stuffing boxes. Watertight external connection box for the protection of wiring.

CONTROLLER Cutler-Hammer reversible, 20 HP drum, with time-limit overload circuit breaker in metal cabinet, which is re-set when controller is returned to the "off" position. Rheostat consisting of zinc-plated cast grids.

The brake automatically sets and holds the load whenever the controller is returned to the "off" position, or whenever the overload circuit breaker opens the circuit.

Diehl Manufacturing Co. **Elizabeth, N. J. U. S. A.**

DIEHL

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Merchant Steel Vessels over 100 Tons, Completed, Building and Contracted for in American Shipyards from Jan. 1, 1925 to Jan. 1, 1926

Vessel	Yard	Type	Class	Gross	Owners	Mach.	H.P.	Len. ft. in.	Brdt. ft. in.	Dep. ft. in.	Fuel	Remarks	Status
Albany	Staten Island S. B. Co.	Ferry	Harbors	1389	N. Y. Central Railroad	Recip.	1600	210	45	17 6	Oil	Pass. and Automobiles	Completed
Algiers	Howard Ship Yd. & Dk. Co.	Ferry	Rivers	501	Algiers Pub. Service Co.	Recip.	250	150	64	9 3½	Coal	Catamaran-side wheeler	Completed
American Legion	Staten Island S. B. Co.	Ferry	Harbor	2600	City of New York	Recip.	2400	264	47	20 2½	Oil	Municipal Ferry Service	Under con.
Ann Arbor No. 7	Manitowoc S. B. Corp.	Ferry	Lakes	2934	Ann Arbor Railroad	Recip.	2800	360	56	21 6	Coal	Car ferry—Great Lakes	Completed
Belfont	Marietta Mfg. Co.	T. Boat	Rivers	160	Ind. Belfont Transp. Co.	Oil Eng.	360	120	24	4 4	Oil	River Towing	Under con.
Belle Island	Harry A. Marvel	Pass.	Sound	842	Belle Island Co., Inc.	Recip.	1800	211	42	12	Coal	Rivers & Bay Passenger	Completed
Brockville	New London Ship & E. Co.	Ferry	Rivers	....	B'ville & M. Transp. Co.	Oil Eng.	300	125	..	..	Oil	Pass. and Automobiles	Under con.
Burnette	Nashville Bridge Co.	T. Boat	Rivers	....	U. S. Engineers	Oil Elec.	150	86	17	3 9	Oil	River Towing	Under con.
Cary-Bird	Marietta Mfg. Co.	Ferry	Rivers	201	Cairo City Ferry Co.	Recip.	200	161	30	5 2	Coal	Pass. and Automobiles	Completed
Charles J. Miller	Howard Ship Yd. & Dk. Co.	Ferry	Rivers	226	Vicksburg & Delta Ferry Co.	Recip.	200	150	32	5	Coal	Stern Wheeler	Completed
Charles C. West	Manitowoc S. B. Corp.	Cargo	Lakes	6645	Rockport Steamship Co.	Recip.	2000	470	60	31	Coal	Bulk Cargo-Self Unloader	Completed
Chatham	Newport News S. B. Co.	Pass.	Ocean	5500	Merchants & Miners	Turbine	2700	368	52	36	Oil	Pass. Service Coastwise	Under con.
Cherokee	Newport News S. B. Co.	Pass.	Ocean	5896	Clyde Steamship Co.	Turbine	4200	402	54	31 6	Oil	N. Y.-Carolina-Florida	Completed
City of Pittsburgh	American Bridge Co.	T. Boat	River	....	Carnegie Steel Co.	Recip.	1400	171 10	38 10	6 4	Coal	River Towing	Completed
Clackamas	Portland, Ore.	Dredge	Harbors	2390	Port of Portland, Ore.	Oil Elec.	3400	236	50	12 9	Oil	Pipe Line Hyd. Dredge	Completed
Coamo	Newport News S. B. Co.	Pass.	Ocean	7057	Coamo Steamship Corp.	Turbine	6000	429	59 6	35	Oil	New York to Porto Rico	Completed
Col. James Picklands	American S. B. Co.	Cargo	Lakes	7935	Interlake Steamship Co.	Recip.	2200	600	60	32	Coal	Great Lakes Bulk Freighter	Under con.
Colorado	Sun S. B. & D. D. Co.	Cargo	Rivers	443	Ard'an National Corp.	Recip.	....	194 10¼	..	5	O.1	Magdalena River, S. A.	Completed
District of Columbia	Pusey & Jones	Pass.	Bays	2128	Norfolk & Wash. S. B. Co.	Recip.	2400	305 6	51	18	Coal	Washington-Norfolk Run	Completed
Dorchester	Newport News S. B. Co.	Pass.	Ocean	5500	Merchants & Miners Co.	Turbine	2700	368	52	36	Oil	Pass. Service Coastwise	Under con.
E. D. Kenna	Chas. Ward Eng. Works	T. Boat	Rivers	300	Ohio River Co.	Recip.	700	171 5½	32	6 6	Coal	River Towing	Under con.
Edward Riegelmann	Todd S. B. Corp.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Edwin N. Bisso	Nashville Bridge Co.	Ferry	Rivers	213	Bisso Ferry Co.	Recip.	650	140	59	10	Coal	Catamaran	Completed
El Oceano	Federal S. B. & D. D. Co.	Cargo	Ocean	6767	Southern Pac. S. S. Lines	Turbine	5500	433	56	37	Oil	Express Freight Service	Completed
Fairfax	Newport News S. B. Co.	Pass.	Ocean	5500	Merchants & Miners Co.	Turbine	2700	368	52	36	Oil	Pass. Service Coastwise	Under con.
Frank A. Cunningham	Staten Island S. B. Co.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
General	Union Plant, Beth. S. B.	Tanker	Rivers	560	Gen. Petroleum Corp.	Oil Elec.	500	176 6	32	14	Oil	San Francisco Bay	Completed
George T. Price	Charles Ward Eng. Works	T. Boat	Rivers	236	W. C. Kelly Barge Line	Oil Eng.	720	126	26	7	Oil	River Towing	Completed
Georgia	Charleston D. D. & M. Co.	T. Boat	Rivers	....	U. S. Engineers	Recip.	....	153 4½	30	4 6	Coal	Stern Wheel River Towboat	Completed
Gillette	Nashville Bridge Co.	T. Boat	Rivers	....	U. S. Engineers	Oil Elec.	150	86	17	3 9	Oil	River Towing	Under con.
Gouverneur	Howard Shipyd. & Dk. Co.	T. Boat	Rivers	183	U. S. Engineers	Oil Elec.	250	121 ⅝	23	5	Oil	Stern Wheel Towboat	Under con.
Gulfcrest	New York S. B. Corp.	Tanker	Ocean	9500	Gulf Refining Co.	Oil Eng.	4000	479 3	65	38 4	Oil	Ocean tanker	Under con.
Halcyon	Gt. Lakes Eng. Wks.	Ferry	Rivers	405	Walkerville Ferry Co.	Recip.	810	142 2	44 11	15 8	Coal	Detroit River Ferry	Completed
Hampton Roads	Pusey & Jones	Pass.	Bay	750	Chesapeake Ferry Co.	Recip.	....	200	60	9	Coal	Sewall's Pt.-Newport News	Completed
Haviside No. 4	Pac. Coast Eng. Co.	Barge	Harbor	491	Haviside Co.	Hoist	....	125	40	12	Oil	Lifts and Salvage	Completed
Hawaiian Standard	Union Plant, Beth. S. B.	Tanker	Bays	1271	Standard Oil Co. Calif.	Oil Elec.	800	221 7½	36	16	Oil	Hawaiian Islands Trade	Completed
Henry A. Meyer	Staten Island S. B. Co.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Henry Bruckner	Staten Island S. B. Co.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Hull No. 86	Federal S. B. & D. D. Co.	Tanker	Ocean	12700	Gulf Refining Co.	Oil Eng.	4000	543	74	40 6	Oil	Ocean Tanker-Oil	Ordered
Hull No. 87	Federal S. B. & D. D. Co.	Lighter	Harbors	300	Wm. Spencer & Son	Oil Eng.	400	110	32	16	Oil	Harbor Lighterage	Ordered
Hull No. 88	Federal S. B. & D. D. Co.	Lighter	Harbors	300	Wm. Spencer & Son	Oil Eng.	400	110	32	16	Oil	Harbor Lighterage	Ordered
Hull No. 170	Moore Dry Dock Co.	Ferry	Bays	....	Key System Transit Co.	Turb. Elec.	3500	276	47	21	Oil	East Bay-San Francisco	Under con.
Hull No. 171	Moore Dry Dock Co.	Ferry	Bays	....	Key System Transit Co.	Turb. Elec.	3500	276	47	21	Oil	East Bay-San Francisco	Under con.
Hull No. 294	Newport News S. B. Co.	Tug	Harbor	186	Penna. R. R.	Oil Elec.	680	105	24	14	Oil	Float Towing	Inst. mch.
Hull No. 295	Newport News S. B. Co.	Tug	Harbor	186	Penna. R. R.	Oil Elec.	680	105	24	14	Oil	Float Towing	Inst. Mch.
Hull No. 306	Newport News S. B. Co.	Pass.	Ocean	6500	N. Y. & Miami S. S. Corp.	Turbine	8500	407 3	62	30 6	Oil	New York-Florida Service	Ordered
Hull No. 307	Newport News S. B. Co.	Pass.	Ocean	6500	N. Y. & Miami S. S. Corp.	Turbine	8500	407 3	62	30 6	Oil	New York-Florida Service	Ordered
Hull No. 315	Newport News S. B. Co.	Pass.	Ocean	22000	American Line S. S. Corp.	Turb. Elec.	17000	601 3	80	52	Oil	N. Y.-Panama-Pacific	Under con.
Hull No. 317	Newport News S. B. Co.	Pass.	Ocean	6000	Clyde Steamship Co.	Turbine	4200	402	55	31 6	Oil	New York-Florida Service	Under con.
Hull No. 518	Wm. Cramps S. & E. B. Co.	Pass.	Ocean	4800	Eastern S. S. Lines	Turbine	7500	378	55 6	29 6	Oil	Boston-Yarmouth	Under con.
Hull No. 1030	Pusey & Jones	Pass.	Bay & R.	1240	Ericsson Line	Recip.	....	219	45	11	Oil	Baltimore to Philadelphia	Under con.
Hull No. 1031	Pusey & Jones	Pass.	Bay	1240	Ericsson Line	Recip.	....	219	45	11	Oil	Baltimore to Philadelphia	Ordered

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Hull No. 1398	Fore River Plant, Beth.	Ferry	Harbor	930	City of Boston	Recip.	860	172	41	17	Coal	Harbor Service	Under con.
Hull No. 1399	Fore River Plant, Beth.	Ferry	Harbor	930	City of Boston	Recip.	860	172	41	17	Coal	Harbor Service	Under con.
Hull No. 3501	Harlan Plant, Beth. S. B.	Ferry	Harbor	970	Phila. & Reading R. R.	Recip.	1100	200	55	16	Coal	Harbor Ferry Service	Under con.
Hull No. 3502	Harlan Plant, Beth. S. B.	Ferry	Harbor	970	Phila. & Reading R. R.	Recip.	1100	200	55	16	Coal	Harbor Ferry Service	Under con.
Hull No. 3504	Harlan Plant, Beth. S. B.	Pass.	Coast	600	Fishers Island Nav. Co.	Recip.	750	159	40	15 6	Coal	Passenger and Automobile	Ordered
Hull No. 5328	Union Plant, Beth. S. B.	Tanker	Bay	613	Richfield Oil Co.	Oil Eng.	250	181	32	12	Oil	Bay Tanker	Under con.
Island Queen	Midland Barge Co.	Pass.	Rivers	986	Coney Island Co.	Recip.	1200	285	46	8	Coal	River Service	Completed
James V. Crawford	T. A. Kyle Shipyards	Ferry	Lake	207	Morristown Trans. Co.	Oil Eng.	180	100	40	9 6	Oil	Pass. and Automobiles	Completed
John A. Lynch	Staten Island S. B. Co.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
John A. Topping	Great Lakes Eng. Wks.	Cargo	Lakes	8345	Columbia Steamship Co.	Recip.	2400	618	62	32	Coal	Bulk Cargo Great Lakes	Completed
John H. McCooey	Todd S. B. Corp.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Joseph A. Guider	John W. Sullivan Co.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Joseph J. O'Brien	John W. Sullivan Co.	Ferry	Harbor	560	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Joseph H. Frantz	Great Lakes Eng. Wks.	Cargo	Lakes	8289	Columbia Steamship Co.	Recip.	2400	618	62	32	Coal	Bulk Cargo Great Lakes	Completed
Julius Miller	Todd S. B. Corp.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
King's Landing	Nashville Bridge Co.	T. Boat	Rivers	142	Kosmos P. Cement Co.	Oil Eng.	240	75 6	19	5 9	Oil	River Towing	Under con.
Klamath	Union Plant, Beth. S. B.	Ferry	Harbors	1952	Southern Pacific Co.	Recip.	1400	246	44 8⅛	19 2½	Oil	Richmond-San Francisco	Completed
Kosmortar	Nashville Bridge Co.	T. Boat	Rivers	....	Kosmos Port. Cement Co.	Oil Eng.	240	75 6	19	5 9	Oil	River Towing	Completed
L. A. City No. 2	Los Angeles S. B. & D. D. Co.	Fire B.	Harbors	106	City of Los Angeles	Gasolene	900	99	19	9 7	Gas	Los Angeles Fire Boat	Completed
Malolo	Wm. Cramps S. & E. B. Co.	Pass.	Ocean	17200	Matson Navigation Co.	Turbine	25000	582	83	44 6	Oil	San Francisco to Hawaii	Under con.
Manitowoc	Manitowoc S. B. Corp.	Ferry	Lakes	....	Wabash Railroad Co.	Recip.	4000	370	65	21 6	Coal	Railroad Car Ferry	Under con.
Maurice E. Connelly	Todd S. B. Corp.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Mohawk	Newport News S. B. Co.	Pass.	Ocean	5896	Clyde Steamship Co.	Turbine	4200	402	54	31 6	Oil	N. Y.-Carolina-Florida	Completed
Montgomery	Charleston D. D. & M. Co.	Snag B.	Rivers	....	U. S. Engineers	Recip.	....	178	33	5 6	Coal	Snagging-Alabama River	Under con.
Motormates	Hanlon D. D. & S. B. Co.	Tanker	Bay	273	Associated Oil Co.	Oil Eng.	160	120	32	8 6	Oil	San Francisco Bay	Completed
Murray Hulbert	Todd S. B. Corp.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Nashville B.	Nashville Bridge Co.	T. Boat	Rivers	....	Nashville Bridge Co.	Oil Eng.	400	131	28	5 3	Oil	River Towing	Under con.
New Orleans	Union Plant, Beth. S. B.	Ferry	Harbors	1953	Southern Pacific Co.	Recip.	1500	246	44 8⅛	19 2½	Oil	Richmond-San Francisco	Completed
New Orleans	Howard Ship Yd. & Dk. Co.	Ferry	Rivers	501	Algiers Pub. Service Co.	Recip.	250	150	64	9 3½	Coal	Catamaran-side wheeler	Completed
Newton	Harlan Plant, Beth. S. B.	Tug	Harbors	195	D. L. & W. Railroad	Recip.	900	100	25	13 3	Coal	Shifting Tug N. Y. Harbor	Completed
Nobska	Bath Iron Works	Pass.	Sound	1089	New England S. S. Co.	Recip.	1200	210	36	14 6	Coal	New Bedford-Nantucket	Completed
Norfolk	Newport News S. B. Co.	Dredge	Harbors	....	Atlantic Gulf & P. Co.	Oil Eng.	....	162	38	14	Oil	Hyd. Pipe Line Dredge	Completed
North Star	Nashville Bridge Co.	T. Boat	Rivers	153	Dillman Egg Case Co.	Oil Eng.	480	111	26	6	Oil	River Towing	Completed
Philip D. Block	American S. B. Co.	Cargo	Lakes	7931	Pioneer Steamship Co.	Recip.	2200	600	60	32	Coal	Bulk Cargo Great Lakes	Completed
Port Houston	Harlan Plant, Beth. S. B.	Fireboat	Harbor	380	Port of Houston	Oil Elec.	720	125 10	27	14	Oil	Harbor Service	Under con.
Raymond	Newport News S. B. Co.	Dredge	Harbors	1200	U. S. Engineers	Oil Elec.	....	230	40	14	Oil	Dredging	Under con.
Redline	Moore S. B. & D. D. Co.	Tanker	Bay	389	Union Oil Co.	Oil Eng.	330	175 9	36	7	Oil	San Francisco Bay	Completed
Robert E. Lee	Newport News S. B. Co.	Pass.	Ocean	5195	Old Dominion S. S. Co.	Turbine	4750	389 9	53 9	29 9	Oil	N. Y. and Norfolk Service	Completed
Samuel L. May	Howard Ship Yd. & Dk. Co.	T. Boat	Rivers	150	Union Sand & Gravel Co.	Recip.	225	150	28	5	Coal	Steam stern wheel	Completed
Sam P. Suit	Marietta Mfg. Co.	T. Boat	Rivers	296	Island Creek Coal Co.	Recip.	600	148	30	5 2	Coal	River Towing	Completed
Samuel Mather	American S. B. Co.	Cargo	Lakes	7935	Interlake Steamship Co.	Recip.	2200	600	60	32	Coal	Great Lakes Bulk Freighter	Under con.
Seminole	Newport News S. B. Co.	Pass.	Ocean	5896	Clyde Steamship Co.	Turbine	4200	402	54	31 6	Oil	N. Y.-Carolina-Florida	Completed
Steel Chemist	Federal S. B. & D. D. Co.	Cargo	Lakes	1695	U. S. Steel Products Co.	Oil Eng.	950	257 7	42 9	20	Oil	Great Lakes-St. Lawrence	Under con.
Steel City	Marietta Mfg. Co.	T. Boat	Rivers	350	Steel City Navig. Co.	Recip.	750	164	30	5 2	Coal	River Towing	Under con.
Steel Electrician	Federal S. B. & D. D. Co.	Cargo	Lakes	1695	U. S. Steel Products Co.	Oil Elec.	750	257 7	42 9	20	Oil	Great Lakes-St. Lawrence	Under con.
Stroudsburg	Harlan Plant, Beth. S. B.	Tug	Harbors	195	D. L. & W. Railroad	Recip.	900	100	25	13 3	Coal	Shifting Tug N. Y. Harbor	Completed
T. W. Robinson	American Ship B. Co.	Cargo	Lakes	7726	Bradley Trans. Co.	Turb. Elec.	3100	586	60	32	Coal	Self Unloader-Great Lakes	Completed
U. S. Chicot	Howard Ship Yd. & Dk. Co.	T. Boat	Rivers	132	U. S. Engineers	Recip.	160	127 6	23	4 6	Coal	River Towing	Completed
William C. Atwater	Great Lakes Eng. Wks.	Cargo	Lakes	7768	Wilson Transit Co.	Recip	2100	603 10	60	32	Coal	Bulk Cargo Great Lakes	Completed
William G. Mather	Great Lakes Eng. Wks.	Cargo	Lakes	8662	Cleveland Cliffs S. S. Co.	Recip.	2500	618	62	32	Coal	Bulk Cargo Great Lakes	Completed
Wm. J. Connelley	Globe Shipbuilding Co.	Cargo	Ocean	1400	Connelley Transp. Co.	Oil Eng.	800	250	42	..	Oil	Freight Atlantic Coastwise	Completed
William T. Collins	Staten Island S. B. Co.	Ferry	Harbor	593	City of New York	Recip.	650	151	37 6	15	Oil	East River Ferry	Completed
Wm. T. Rossel	Sun S. B. & D. D. Co.	Dredge	Harbors	....	U. S. Engineers	Oil Elec.	....	268 5	46	22 6	Oil	Dredging Harbors	Completed
Willets Point	Federal S. B. & D. D. Co.	Dredge	Ocean	1000	U. S. Engineers	Oil Eng.	1000	200 2	41	19 6	Oil	Harbor Dredging	Under con.
York	Spedden S. B. Co.	Ferry	Bays	260	W. T. Ashe	Oil Eng.	240	115	33	12	Oil	Yorktown-Gloucester Point	Completed

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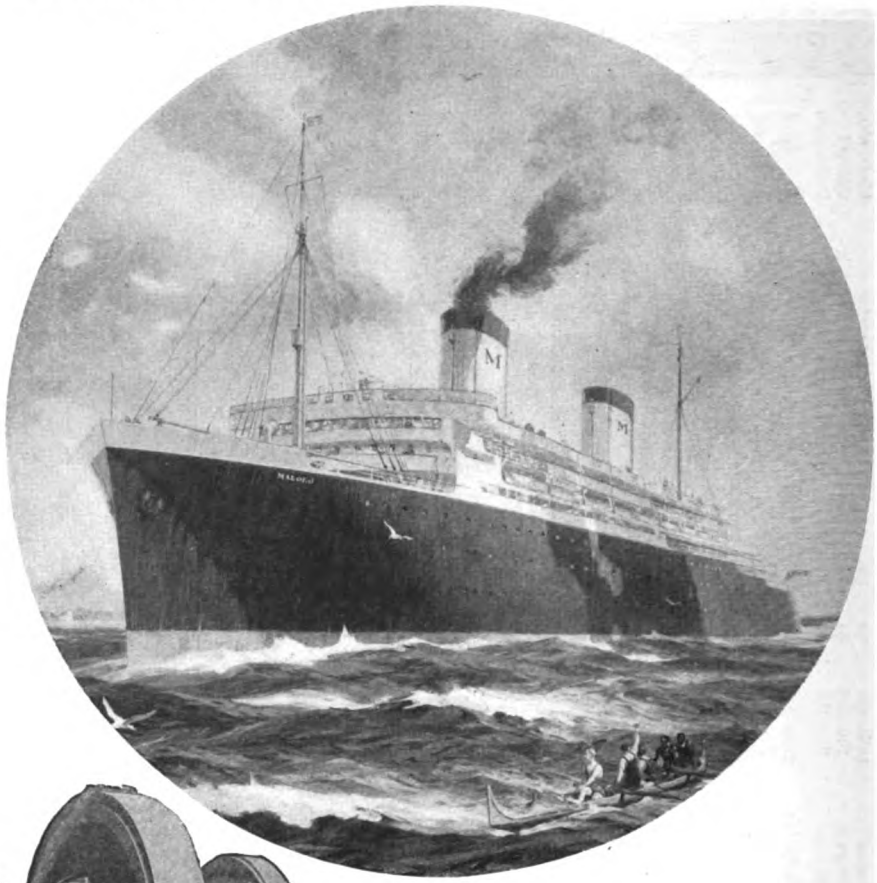
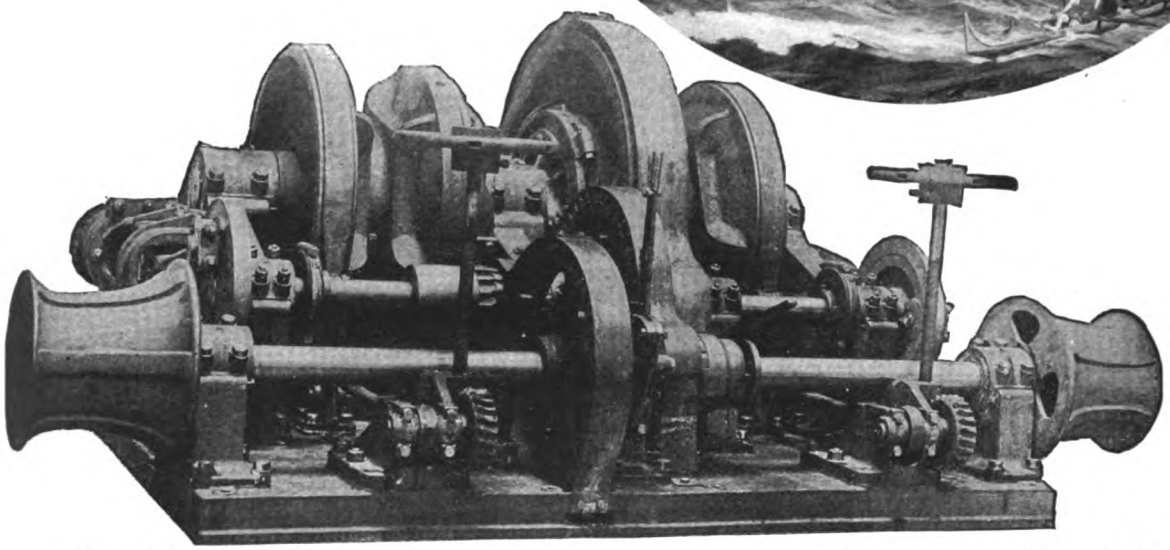
UNQUESTIONED in its supremacy, Hyde Marine Auxiliary Machinery is accepted as the standard in the finest ships and the finest fleets. One of the ships recently equipped is the "Malolo", for which we furnished the windlass, capstans and cargo winches. Its specification and use is another evidence of Hyde recognition by Naval Architects, Shipbuilders and Ship Operators.

Below is a list of some of the more recent installations made on some outstanding new boats.





HYDE Steam Spur Geared Windlass

MALOLO		Windlass	Capstans	Winches	
NOBSKA	Steerer	Windlass	Capstans	Winches	
ALBANY	Steerer				
EL OCEANO	Steerer	Windlass	Capstan	Winches	
WM. G. MATHER		Windlass		Mooring	Winches
COAMO			Gypsies		
MOHAWK, SEMINOLE and CHEROKEE			Gypsies		
ROBERT E. LEE			Gypsies		
MURRAY HULBERT and CLASS	Steerers				
GULFCREST	Steerer	Windlass	Gypsies	Winches	
CHATHAM and CLASS	Steerer	Windlass	Gypsies		
HAMPTON ROADS	Steerer				
HULL No. 84 (Federal)	Steerer	Windlass	Cable Reel	Winches	
AMERICAN LEGION	Steerer				
HALYCON	Steerer				
MONTGOMERY	Steerer		Capstan and Gypsy		
JOHN A. TOPPING		Windlass		Mooring	Winches

HYDE Marine Auxiliary Machinery includes windlasses, steering gears, telemotors, capstans and cargo winches—steam, hand and electrically driven, as well as Manganese Bronze Propellers.

HYDE WINDLASS COMPANY :-: :-: Bath, Maine

HYDE **Marine Auxiliary Machinery**

Please mention MARINE REVIEW *when writing to Advertisers*

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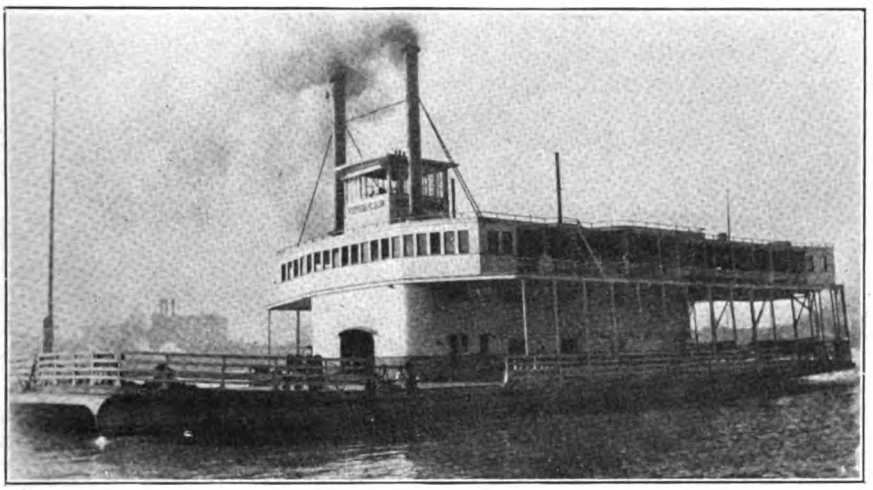
ALGIERS—Catamaran Ferry—Paddle Wheel—Steam



DESCRIPTION

A steel ferry boat, catamaran type with double hulls and paddle wheel aft between hulls. Main deck has steel enclosure for machinery and open space for vehicles; the boiler deck is of steel and is provided with cabins for passengers. These boats are in use on the Mississippi river in the passenger and automobile service between New Orleans and Algiers, La.

Owner—Algiers Public Service Co.
Builder—Howard Shipyard & Dock Co.
Naval Architect—Warren Johnson
Launched—March 28, 1925
Completed—Nov. 25, 1925
Sister Boat—NEW ORLEANS, launched May 19, 1925, completed Nov. 25, 1925
Classification—American bureau of shipping

HULL PARTICULARS

Length over all, 150 feet 6 inches; length between perpendiculars, 144 feet; breadth at deck, 67 feet; breadth of hulls molded, 18 feet; depth molded, 9 feet 6 inches; displacement loaded, 375 tons; draft, 5 feet 6 inches; gross tonnage, 501; net tonnage, 501; passenger capacity, 500; cargo capacity, 70 automobiles; bunker coal fuel capacity in tons, 15; speed, 12 miles.

MACHINERY PARTICULARS

Main Engines—Two Western rivers stern wheel type, 18-inch bore x 72-inch stroke, built by Iowa City Machine Works.

Boilers—Two Western rivers flue type, 50 inches in diameter by 26 feet long, built by Fowler-Wolfe Co.; working pressure 175 pounds per square inch; fuel, coal.

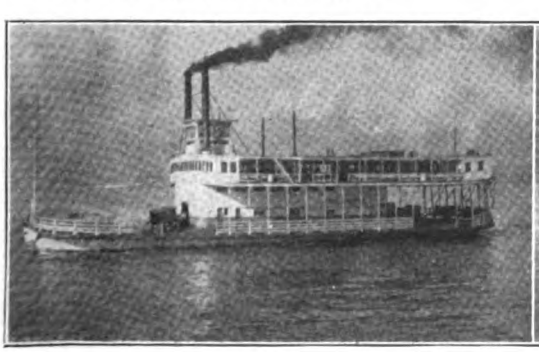
AUXILIARY EQUIPMENT

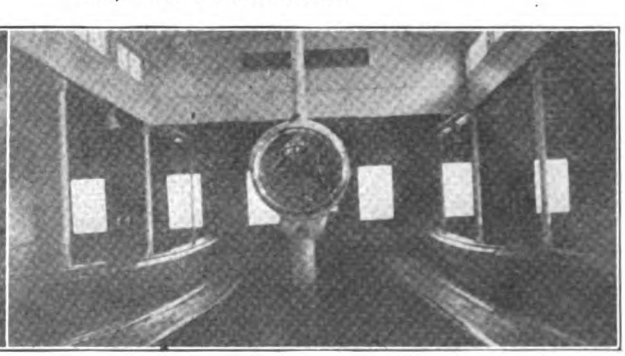
Manufacturers of:

Pumps—Shelton, Worthington
Steering Engine—Gardner special
Electric Generator—One 10 k. w.—Engberg
Water Purifier—Greer

These interesting steel hull catamaran type ferries represent the development of unique and peculiar types to suit local conditions of service. It has been found in practice that for the run between Algiers and New Orleans that this type of boat works out to best advantage. The entire lower portions of the boats are of steel. The lower deck will accommodate 70 automobiles as compared with 40 for the largest ferry previously operated. The passenger accommodations will be on the upper deck where the passengers will be entirely separated from vehicles and traffic. The cabins on this deck have been finished in an attractive manner and 500 persons can comfortably be carried.

The latest fire fighting and life saving equipment is installed. The cylindrical hulls of the boats are divided into 22 watertight compartments and are equipped with syphons in each. The steering gear of the Gardner type is direct-connected to rudders and special care and attention has been given to this design. There is an extra emergency rudder connection which insures the possibility of steering the boat under any and all conditions.





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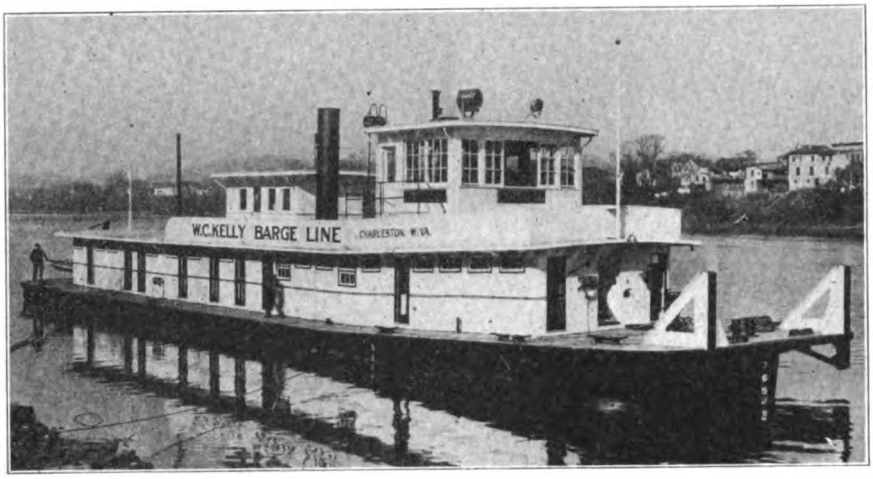
GEO. T. PRICE—River Towboat—Stern Wheel—Diesel



DESCRIPTION

This twin screw diesel engined shallow draft river towboat constructed of steel, is the first of several such vessels to be completed for service between Pittsburgh, Memphis, Tenn., and points as far south as New Orleans. Performance on the first trip in service checked closely with model tests made before the construction of the boat was started.

Name—GEO. T. PRICE.
Owner—W. C. Kelly Barge Line
Builder—Chas. Ward Engineering Works
Naval Architect—Chas. Ward Eng. Works
Launched—Oct. 1, 1925
Completed—Nov. 25, 1925
Classification—Western rivers tow boat.

HULL PARTICULARS

Length overall, 126 feet; length between perpendiculars, 126 feet; breadth molded, 26 feet; depth molded, 7 feet; draft, 5 feet; displacement loaded, 330 tons; gross tonnage, 236; net tonnage, 83; bunker fuel capacity in tons, 52; speed, 10½ statute miles per hour.

MACHINERY PARTICULARS

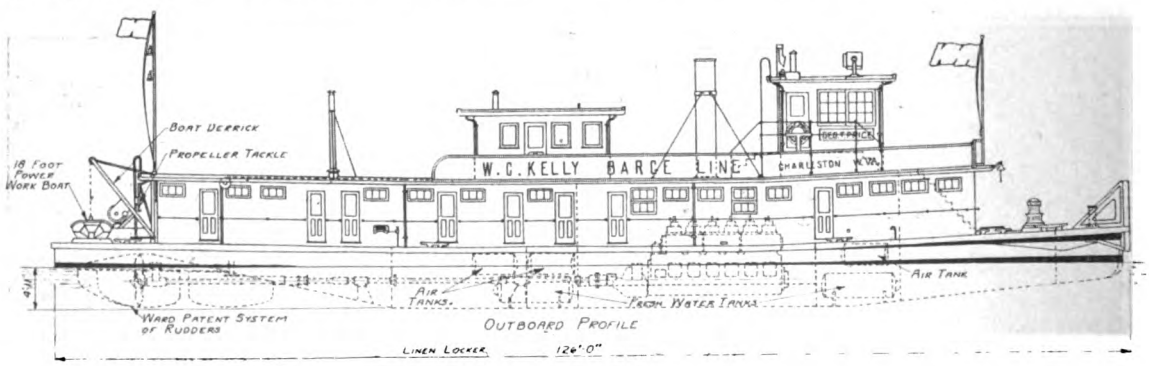
Main Engines—Two 360 horsepower each at 250 revolutions per minute, 2-cycle 6-cylinder 14-inch diameter x 17-inch stroke, Fairbanks-Morse full diesel engines.

AUXILIARY EQUIPMENT

Manufacturers of:
Auxiliary Eng—Two Fairbanks-Morse.
Pump—One 2-inch Fairbanks-Morse
Capstan—One 10 h. p. Hyde
Steering Gear—Chas. Ward & Westinghouse
Propellers—Hyde Windlass Co.
Electric Generators—Two 9-kilowatt Fairbanks-Morse; one 3-killowatt Westinghouse

The towboat has been designed for handling six barges representing a total displacement, including the towboat, of 3875 tons at 6¼ miles per hour in still water, with the barges arranged two abreast. Up to the time this was written the vessel had made only one trip to Pittsburgh and returned to Charleston with three barges loaded with about 1600 tons of steel and made a speed of seven miles per hour, corrected for current.

The diesel engine is rapidly becoming a prominent competitor with steam power plants in vessels navigating the western rivers. This bears out the fact that even conservative river steamboat men are beginning to wake up to the greatly superior economy of the internal combustion engine over their customary steam equipment. It is notorious of course that these steam plants have been very inefficient and it is therefore possible for the diesel engine to make very favorable showing in this class of work. The W. C. Kelly Barge line for which the GEO. T. PRICE was built, intends to enter the transportation field on the Ohio and Mississippi rivers with modern equipment. This line has terminals located at Glassport, Pa., Charleston, W. Va., Evansville, Ind., and Memphis, Tenn. Other terminals will come in time.



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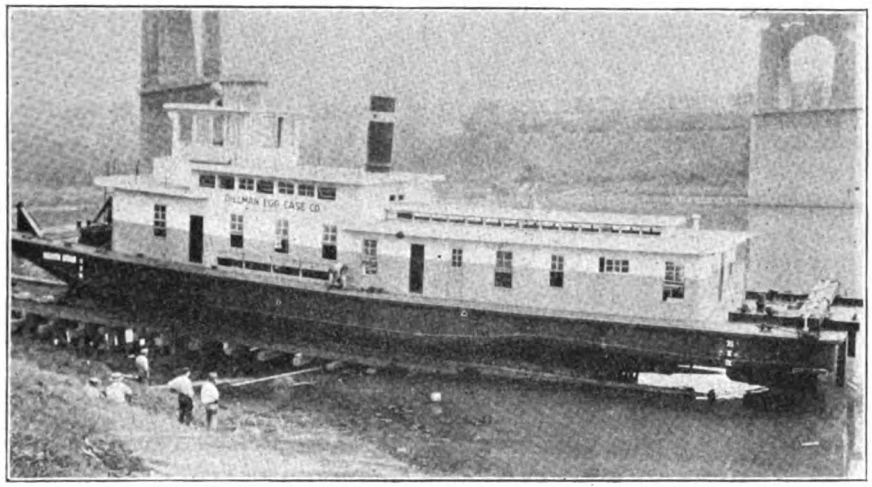
NORTH STAR—Towboat—Twin Screw—Diesel



DESCRIPTION

The NORTH STAR is a splendid example of the modern steel diesel-propelled river towboat. This boat is especially adapted for logging operations. In order to come within the shallow draft required, this boat is fitted with twin engines each direct-connected to a propeller, and the hull is tunneled in way of the screws.

Name—NORTH STAR.
Owner—Dillman Egg Case Co.
Builder—Nashville Bridge Co.
Naval Architect—H. B. Dyer.
Launched—Sept. 15, 1925.
Completed—Sept. 17, 1925.

HULL PARTICULARS

Length over all, 111 feet; length between perpendiculars, 110 feet; breadth molded, 26 feet; depth molded, 6 feet; draft, 4 feet.

MACHINERY PARTICULARS

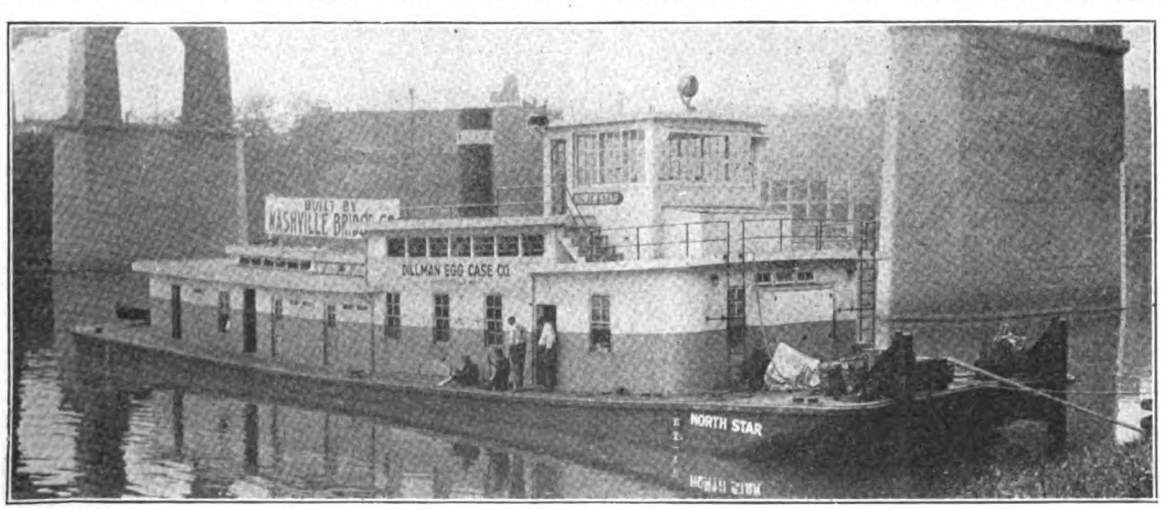
Main Engines—Two, full diesels, 2-cycle 240 horsepower each, Fairbanks-Morse.

AUXILIARY EQUIPMENT

Manufacturers of:
Pumps—Worthington.
Capstan—Laclede Iron Works.
Steering Engine—American Engineering Co.
Propellers—Columbian Bronze Corp.
Electric Generators—Fairbanks-Morse Co.
Stern Bearings—Goodrich Cutlass type.

The twin screw tunnel stern steel towboat built by the Nashville Bridge Co. for the Dillman Egg Case Co. of Carruthersville, Mo., for use in this company's logging operations is a splendid type of modern river boat and is built of steel. It is calculated that at 6 cents per gallon the fuel bill for this boat at the full 480 horsepower will amount to approximately $18 for a 10-hour day. The lubricating oil consumption it is estimated will amount to about $1.25 for a 10-hour day at 50 cents per gallon. Low fuel cost, however, is not the entire anticipated saving. This vessel can be operated with approximately one-half the crew of a steamboat if calculations are correct.

It is likely, however, that to begin with full advantage would not be taken of this in order to insure ample help. This boat will also have a more continuous useful operating time as no letup is necessary for boiler washing or other reasons. The propellers each working in a tunnel, are 64 inches in diameter and do not extend below the base line of the hull. The tunnels have an easy sweep and are designed to offer the least possible resistance to flow of water. The outboard bearings for the propeller shafts art fitted with Goodrich bearings.



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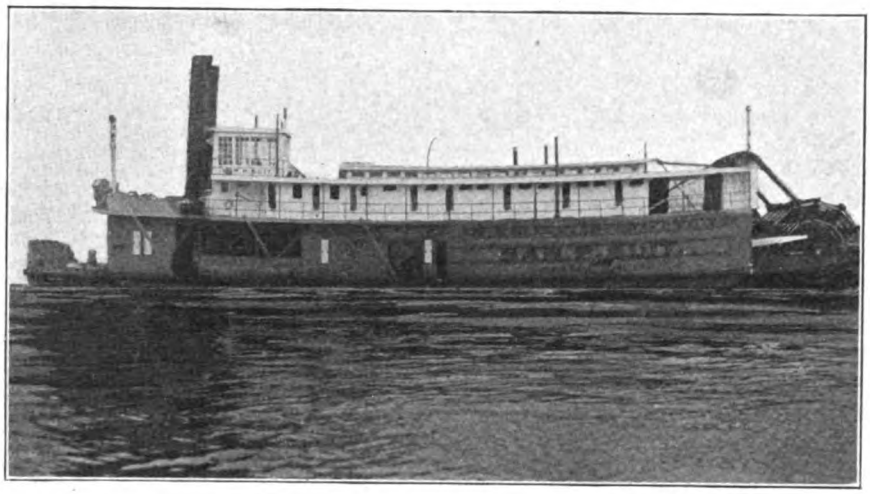
SAM P. SUIT—River Towboat—Stern Wheel—Steam



DESCRIPTION

The SAM P. SUIT is an all-steel stern wheel western rivers towboat of more or less customary standard design. Both hull and engines were constructed by the Marietta Mfg. Co., Point Pleasant, W. Va. There are two engines of tandem compound non-condensing type and coal is burned for fuel. Comfortable quarters are provided for the crew.

Name—SAM P. SUIT.
Owner—Island Creek Coal Co.
Builder—Marietta Mfg. Co.
Naval Architect—Marietta Mfg. Co.
Completed—Nov. 18, 1925
Classification—Western rivers towboat

HULL PARTICULARS

Length over all, 148 feet; length between perpendiculars, 125 feet; breadth molded, 30 feet; depth molded, 5 feet; draft, 3 feet 10 inches; gross tonnage, 296; speed, 10 statute miles per hour.

MACHINERY PARTICULARS

Main Engines—Two, tandem compound non-condensing, 12 x 24 inches, x 72-inch stroke, built by Marietta Mfg. Co.

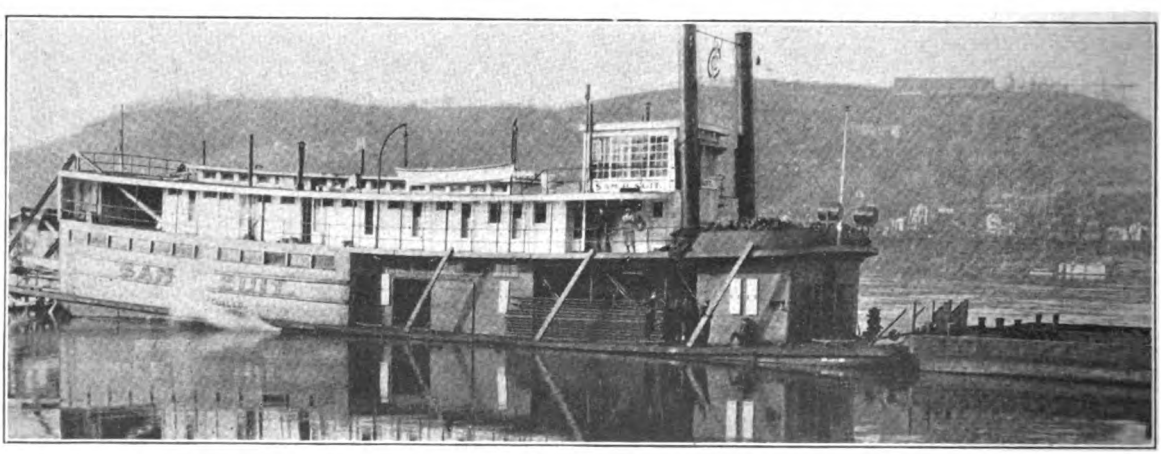
Boilers—Three, Acme Western rivers fire tube type, 42 inches in diameter by 26 feet long with eight 6-inch flues in each; fuel, coal.

AUXILIARY EQUIPMENT

Manufacturers of:

Pumps—Worthington
Capstans—Marietta Mfg. Co.
Refrigeration—Kelvinator Corp.
Electric Generators—Engberg

The SAM P. SUIT is a Western rivers type of towboat and has an all-steel hull with steel forecastle, splash and engine room bulkheads, steel deck truss and boiler deck. The hull is built with longitudinal frame and is very rugged throughout. The cabin and pilot house are of wooden construction with the crew's quarters on the boiler deck. This tow boat is now in service in the coal towing trade between Huntington, W. Va., and Cincinnati. The average tow handled is 10,000 tons carried in steel barges. Constantly increasing use of the inland waters is indicated in the building of boats of this type. More cargo is being moved by economical water routes. Expansion along this line is only in its infancy, and there is practically an unlimited field for the growth of river traffic.



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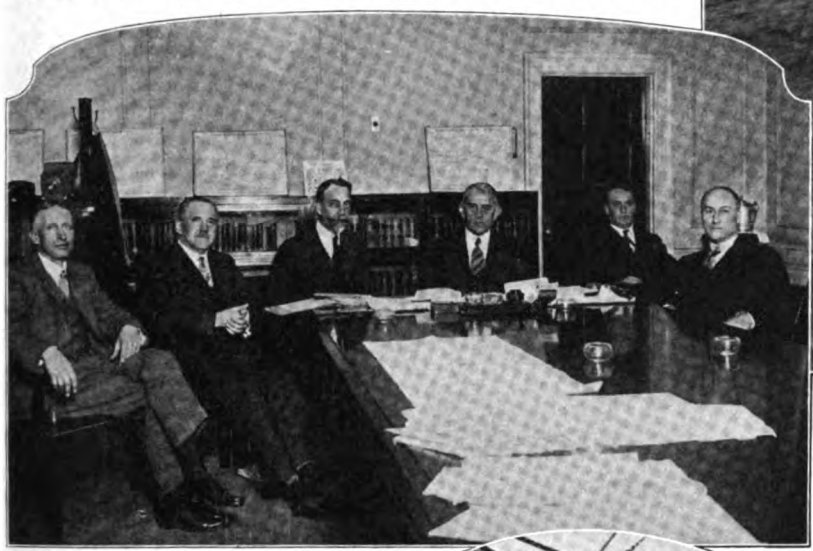
Latest Marine News in Pictures

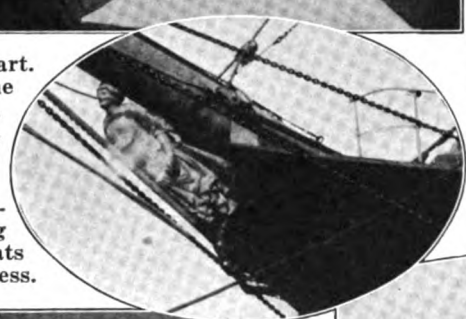
Washington, Jan. 18, planning to protect vessels from icebergs prevalent in the North Atlantic. Left to right: Dr. Henry Bigelow, scientist, Harvard University; Dr. Charles Marvin, chief of the weather bureau; Capt. W. S. Crosley, hydrographer of the navy; Admiral F. C. Billard, commandant of the coast guard and chairman of the board; John Myers Jr., secretary; and Dr. F. C. Brown, assistant director



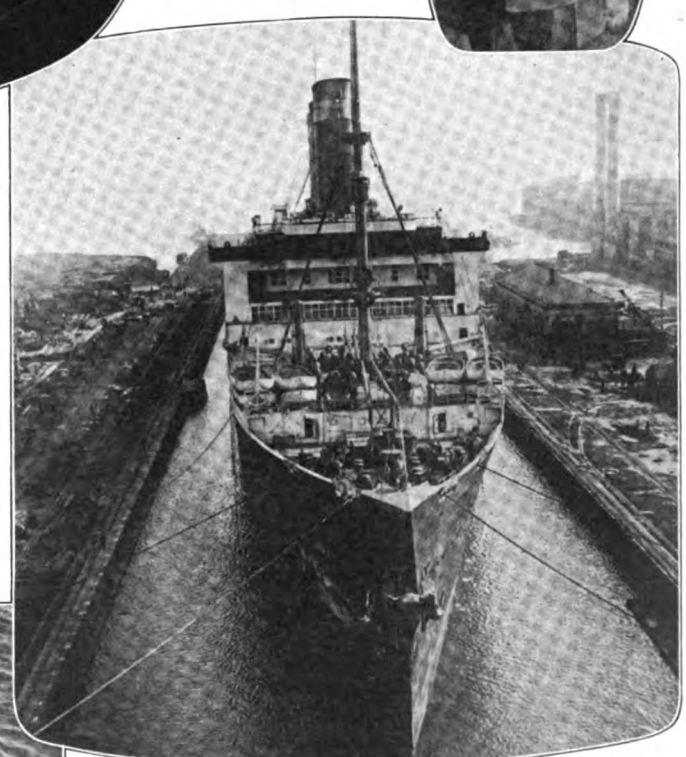
Boarding a giant ocean liner requires strength, agility and steady nerves. Pilot using a Jacob's ladder to board the George Washington.

Capt. Harold A. Cunningham, popular commander of the S. S. George Washington. He has served the American merchant marine with distinction.

A splendid example of a lost art. Finely modeled figurehead on the prow of the Star of Greenland of the Alaska Packer's fleet. Symbol of protection and good luck.



The S. S. Republic in mountainous seas. View aft showing two business-like power life boats equipped with wireless.



When the seas are high it is no mean feat of seamanship to transfer the pilot to or from his ship. The illus- shows a Sandy Hook pilot on his way to board the liner George Washington

To begin her elaborate annual overhauling the Leviathan entered the Commonwealth dry dock in Boston. Though she is 949 feet 9 inches in length overall and exactly 100 feet wide, it is apparent that there is ample room and to spare in this dock for this giant ship

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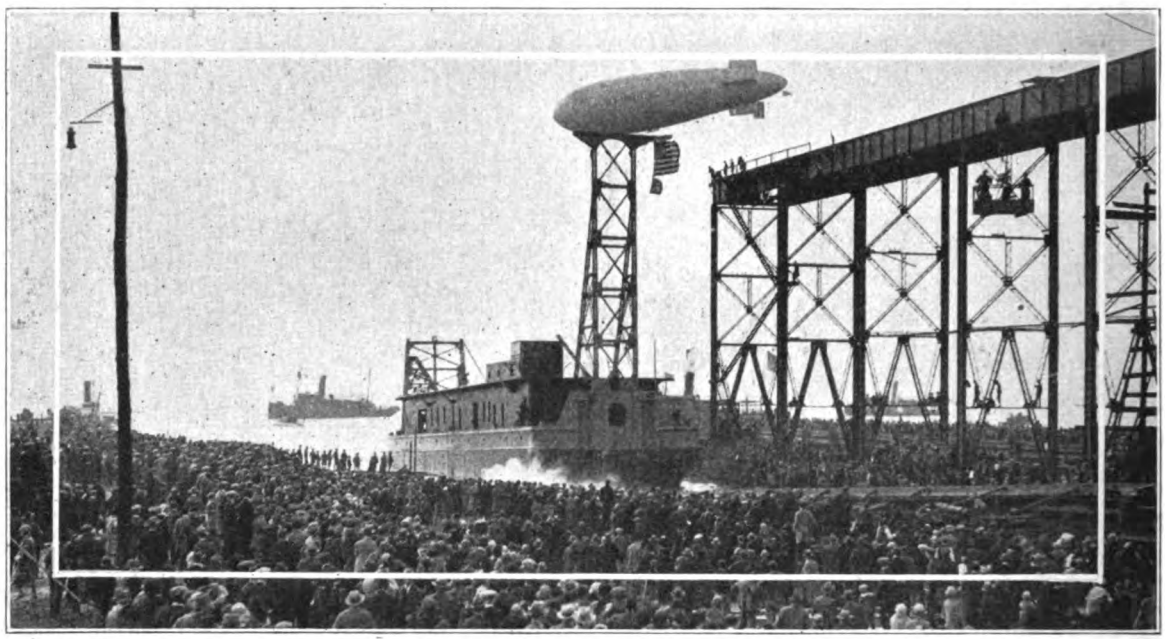
Makes Shipbuilding History While Thousands Look On



U. S. dredge RAYMOND goes overboard at Newport News S. B. & D. D. Co., March 20, 1926

Nine Vessels Launched and Three Keels Laid Within Three Hours on March 20, 1926—Striking Demonstration of the Capacity of Great Shipyard at Hampton Roads

BY E. C. KREUTZBERG

IN SEVERAL particulars Saturday, March 20, earned title as an outstanding date in the history of American shipbuilding. Nine hulls were launched on that day by the Newport News Shipbuilding & Dry Dock Co. This comprises a new record. During the war, Hog Island launched a larger tonnage in a single day, but the record for a day at Hog Island was seven hulls.

On the same day, there was laid down at Newport News a keel for a 601-foot freight and passenger steamer for the Panama-Pacific service of the International Mercantile Marine Co. This is the largest keel ever laid down in a tidewater shipyard in America for a commercial ship.

In still another feature was the day's program of extraordinary interest. Seven of the nine ships went into the water by the float method. They were built on ways which were constructed in 1920 at a cost of $4,000,000 for the special purposes of building two battle cruisers for the United States navy, the CONSTELLATION and the RANGER. The ways were extended both backward and forward, to a total depth of 1000 feet, with a coffer dams at the end which terminate in the James river. Launching was accomplished by opening the gates in the cofferdam, thus permitting the water to rise up in the ways and float the ships. After the level of water in the ways had been elevated to the level of the river, the cofferdams were swung out into the river by tugs, and the hulls, afloat, were towed to their fitting-up berths.

Thousands of Spectators

Nobody ever will know the size of the crowd that attended the day's doings at Newport News. To those who are familiar with the sight of the crowd in a football stadium, it looked as though fully 50,000 visitors were on hand at the shipyard. The crowd included the governors of four states, a number of senators and representatives, high officials of the Shipping board, and many principal executives of railroad, shipbuilding and steel companies, and the builders of machine tools and all kinds of equipment and supplies for ships and shipyards.

To these visitors was extended a concentration of true southern hospitality. Visitors who came to the ancient but highly modern city, were adorned with big blue tags which had been supplied to them by the shipbuilding company. These tags proved to be open sesames to everything that was going on. To these visitors were extended the courtesies of the most exclusive places in the city. The residents wore big buttons on which were printed the words, "I live here—Ask me." They walked blocks out of their way to guide visitors to places they wanted to go. It was the most difficult thing in the world for a visitor to spend much money in Newport News on that day.

Underlying this hospitality was a tremendous enthusiasm all over Newport News toward its shipbuilding industry, which also is its single outstanding industry. The way in which the company has won its way from the black depths of depression

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in 1921 to its present commanding position in shipbuilding activity in this country has appealed to the imagination of the populace. If you stop and talk to almost any resident he will tell you what a fine company the Newport News shipyard is. He will tell you what a wonderful man is Homer Ferguson. To the employes and to the people of Newport News the shipbuilding company is more like a champion football team than merely the basis of the city's prosperity.

As the result of the diversified effort of the Newport News Shipbuilding & Dry Dock Co., the company now has under contract approximately $22,000,000 worth of work. It is employing 6300 men, the largest since the war, during which period the maximum was around 10,000. Among the larger jobs which the yard now has under contract are:

One ship, 429 feet long, for the Porto Rico Line.

Three ships, each 368 feet long, for the Merchants & Miners Transportation Co.

Two ships, each 410 feet long, for the Clyde Line.

One ship, 600 feet long, for the International Mercantile Marine, to be used on the Panama-Pacific line. This ship will be the greatest merchant ship ever built in an American shipyard. It is understood that two more ships of the same class will be built for the International Mercantile Marine, but contracts for them have not yet been let.

One steam yacht, 160 feet long, for Harry Bingham.

One steam yacht, 185 feet long, for Richard M. Cadwalader Jr,

One steam yacht, 188 feet long, for Galen L. Stone.

One steam yacht, 150 feet long, for Hugh J. Chisholm.

One 20-inch pipe-line dredge for the United States war department.

Two 150-foot grain barges for the Pennsylvania railroad.

Three 100-foot house barges for the Chesapeake & Ohio railway.

One 256-foot car float for the Chesapeake & Ohio railway.

Two 80-foot tugboat hulls for the Pennsylvania railroad.

Coast guard cutter for United States government.

Twenty caboose cars for the Seaboard Air Line railway.

Ten locomotives to be repaired for the Chesapeake & Ohio railway, and ten more in prospect.

Five hundred and eighty-four transmission towers for the Southern California Edison Co. under contract.

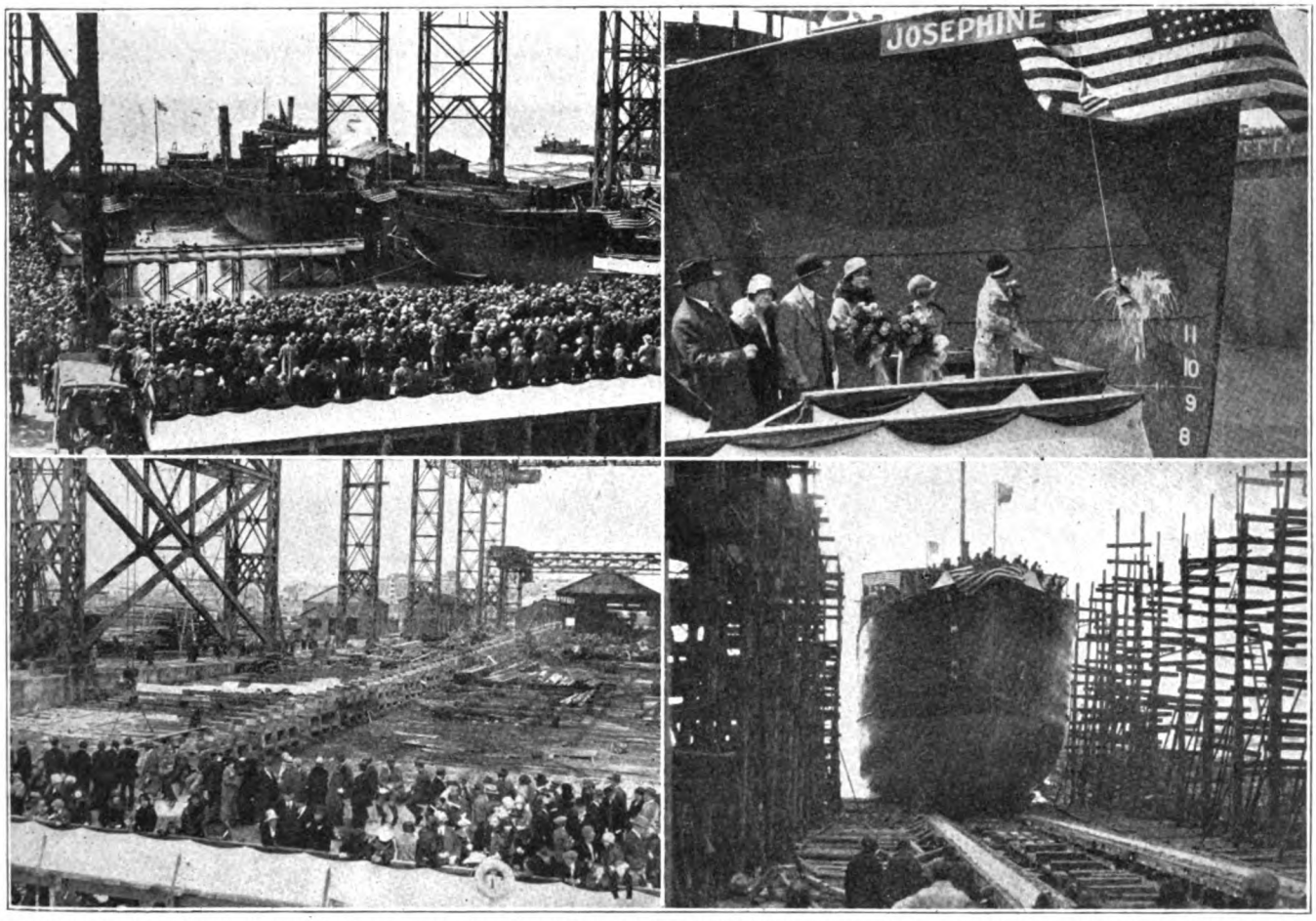
Contract for fabricating 26,000 tons of steel for pipe lines of East Bay Municipal district, Oakland, Cal.

The following vessels were launched by the float method at Newport News on March 20:

SAVARONA—A yacht for Richard M. Cadwalader Jr., Fort Washington, Pa., with Miss Helen Tyson as sponsor. This yacht has an overall length of 185 feet, and is to be powered by twin-screw diesel engines of 1600-horsepower, giving a speed of 16 knots, with a cruising radius of 9000 miles. The large central deckhouse will contain dining-room, library and living-room in addition to pantry and galley. Quarters will comprise seven staterooms and six bathrooms. In commission the yacht will carry a crew of 25. Cox & Stevens are the architects.

JOSEPHINE—A yacht for Edmund S. Burke Jr., Cleveland and New York,

(*Continued on Page* 94)



PHOTOGRAPHS TAKEN ON MARCH 20, 1926 OF THE MULTIPLE LAUNCHINGS AND KEEL LAYINGS AT NEWPORT NEWS, VA.—(UPPER LEFT—LAUNCHING OF THE YACHTS JOSEPHINE, SAVARONA AND ARAS BY THE FLOAT METHOD—(UPPER RIGHT)—MISS PATTY BURKE OF CLEVELAND CHRISTENING HER FATHER'S NEW YACHT, THE JOSEPHINE—(LOWER LEFT)—LAYING THE KEEL OF THE 601FOOT PASSENGER LINER FOR THE PANAMA-PACIFIC LINE OF THE I. M. M. CO.—THE LONGEST KEEL EVER LAID IN AN AMERICAN TIDEWATER SHIPYARD FOR A COMMERCIAL SHIP—(LOWER RIGHT)—LAUNCHING OF THE DORCHESTER ,PASSENGER AND FREIGHT COASTWISE STEAMER FOR THE MERCHANT'S AND MINER'S TRANSPORTATION CO.

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Great International Waterway *Is Wasted* To Flush Chicago's Sewage

BY FRANK B. Willis
United States Senator from Ohio

CHICAGO'S continued diversion of water from the Great Lakes system presents one of the most serious economic problems now facing the people of the United States. There is a crying need for serious attention to this greatest water steal in all history. Those who favor continuation of diversion of water from the Great Lakes system through the Chicago drainage canal profess to gain much comfort from correspondence recently had by the state department with the government of Canada. Careful inquiry into this correspondence discloses that there is no foundation for the flattering unction which the advocates of the drainage canal proposition lay to their souls. The reply of the secretary of state to the Canadian government gives no basis for the claim heralded in various quarters that the United States is defending the continuation of diversion at Chicago. The secretary points out that the assumption of the Canadian government that the withdrawal permit granted the Chicago district by the war department would authorize increased withdrawals cannot be confirmed. On the contrary, the secretary of state does point out that under this very permit, the amount withdrawn is to be gradually reduced to not more than 4167 cubic feet per second.

An International Problem

The whole matter is interesting in that it calls attention to the fact that the unlawful diversion of water at Chicago is not a municipal problem, nor a state problem, nor even a national problem; but, really is international in its scope. Canada has as much right to the waters of the Great Lakes system as the United States, and it is entirely proper that the government of Canada should insist upon the maintenance of its rights.

Indeed, it has been suggested in some quarters that Canada might take steps in the assertion of her rights; that would bring to their senses those who are advocating the continuance of the water steal at Chicago. Plans have been discussed providing for the construction of a canal from Georgian bay straight across the country to the St. Lawrence. If this were done its effect upon Great Lakes navigation would be most serious. It must be admitted, however, in fairness, that Canada would have more right to construct such a canal than the United States has to permit diversion of water at Chicago, because, by this action suggested on Canada's part, water would not de diverted from one system to another; whereas, if the demands of the drainage canal adherents were acceded to there would be a tremendous permanent diversion of water across a water shed from one drainage system to another.

The arguments being put forth in publicity material sent out by the propaganda organization of the drainage district, have reached the silly stage, as suggested in an editorial in a prominent Ohio newspaper. The argument is made that there is a lowering of lake levels because of shortage in rainfall in the St. Lawrence basin. It is, therefore, urged that because there has been a noted lowering of these levels for the reason stated, that therefore, no attention need be paid to the tremendous diversion now going on at Chicago. In other words, if a man is suffering loss of blood because of a wounded foot, he should not object at all if, in order to aid him some self-appointed surgeon opens the jugular vein and lets the remainder of the lifegiving fluid pour out.

It is undoubtedly true that there are fluctuations in lake levels due to natural causes, and that if there had been no diversion at Chicago, there would have been some lowering of lake levels. This fact, however, merely accentuates the importance of decreasing this diversion to the lowest possible minimum. From every quarter evidence accumulates of the undoubted fact that navigation of the Great Lakes, particularly of Lake Erie is seriously threatened by what has been going on.

Adding Artificial to Natural Causes

It needs no technical engineering information to convince a man who owns a little cottage on the lake front and who built his boat house, naturally on the water's edge, and now finds that his boat house is several hundred feet from the water, that there has been a tremendous reduction in lake levels. Likewise, the captain of a great lake carrier that formerly was able to load his vessel to 21 feet, and now is only able to load to between eighteen and nineteen feet, has positive evidence that lake levels are being reduced.

People who are face to face with actual conditions are unable to look with equanimity on the proposal made by adherents of the drainage canal plan that for their own selfish purpose people in and about Chicago shall be permitted to continue this water diversion, when it is known that such continuance means ultimately destruction of the navigation of Lake Erie.

Eastern Ohio and Western Pennsyl-

(*Continued on Page* 85)

Fight Lake Diversion

Much has been written and said about the rank injustice of a great municipality steadily draining the Great Lakes for its own selfish purposes and thus seriously diminishing the economic usefulness of this the greatest waterway in the world. If inveighing against injustice is to bring practical results it is necessary for all of the states and cities vitally affected to act in full concert along the line now partially followed in the co-operation of several states' attorney-generals in prosecuting the case against Chicago before the Supreme Court. Such co-operation should be consolidated and strengthened if the battle of lake drainage is to be won from the powerful mistress of Lake Michigan.

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Double Acting Diesel Completes *Successful 30-day Trial*

First Engine for Shipping Board Conversion Program Passes Satisfactory Non-stop Endurance Test—Marks Notable Achievement of Builders

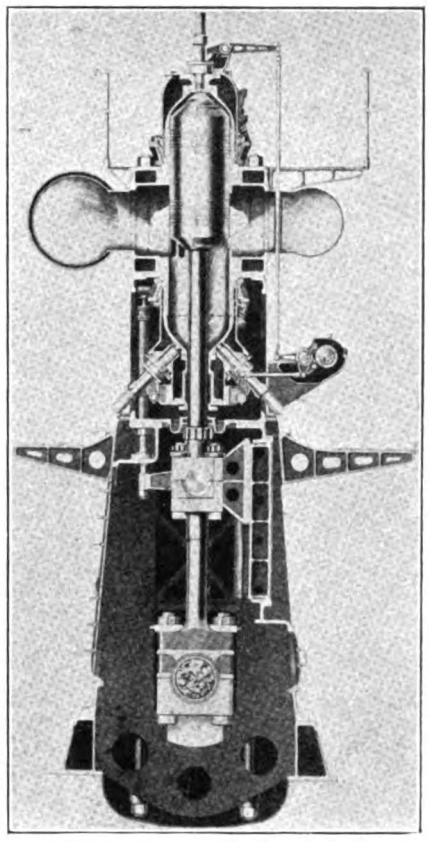

Fig. 1—Section through cylinder and frame—2-cycle, double-acting Diesel engine

THE reported successful termination at Buffalo of a non-stop shop test over a period of 30 days of a new American built double acting two cycle four cylinder marine diesel engine for the shipping board, is an event of great importance in the development of economical propulsive machinery for our merchant marine. It is the culmination of five years of intensive application and the expenditure of large sums of money. Backed up, as there is no reason to doubt it will be later on, by equally successful trials in actual service installed on board ship, this engine represents a distinct step in the reduction of weight and cost per horsepower and the increase of power per unit for the diesel engine, thus greatly enlarging the range of application of this type of motive power to ships.

The Worthington Pump and Machinery Corp. are building to order several new double acting two cycle marine diesel engines, the first one of which has recently completed successfully a thirty day endurance test followed by several days of maneuvering tests at the company's works in Buffalo.

This engine is the first large marine double-acting diesel engine completed for the United States shipping

(*Continued on Page* 90)

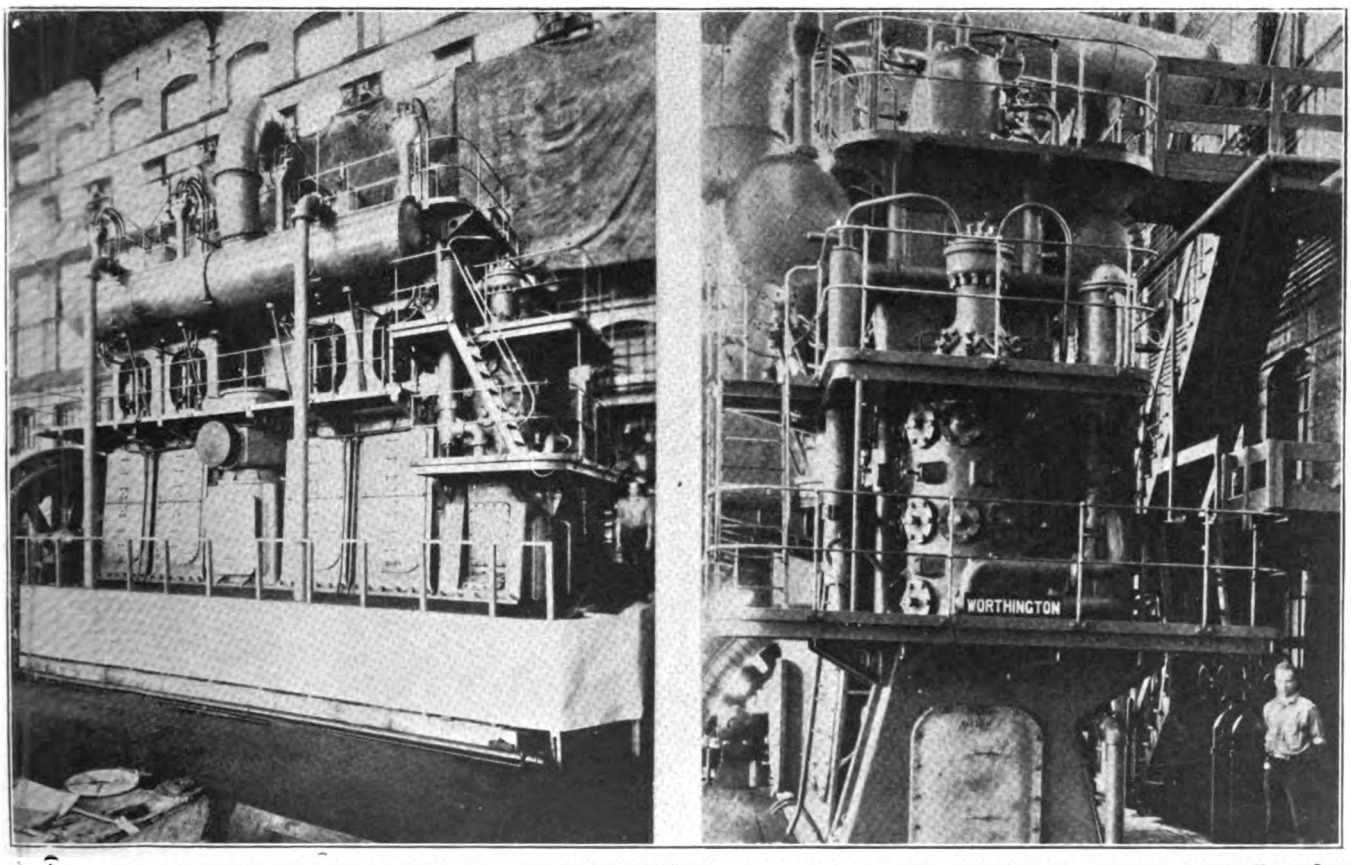

FIG. 2—(LEFT)—EXHAUST SIDE ELEVATION OF A 28-INCH DIAMETER BY 40-INCH STROKE, 4-CYLINDER, 2-CYCLE, DOUBLE-ACTING WORTHINGTON MARINE DIESEL ENGINE—SUBJECTED TO A 30 DAYS NONSTOP TRIAL ENDING SUCCESSFULLY MARCH 4, 1926—(RIGHT)—COMPRESSOR END ELEVATION OF THE SAME ENGINE IN THE SNOW-HOLLY WORKS, BUFFALO

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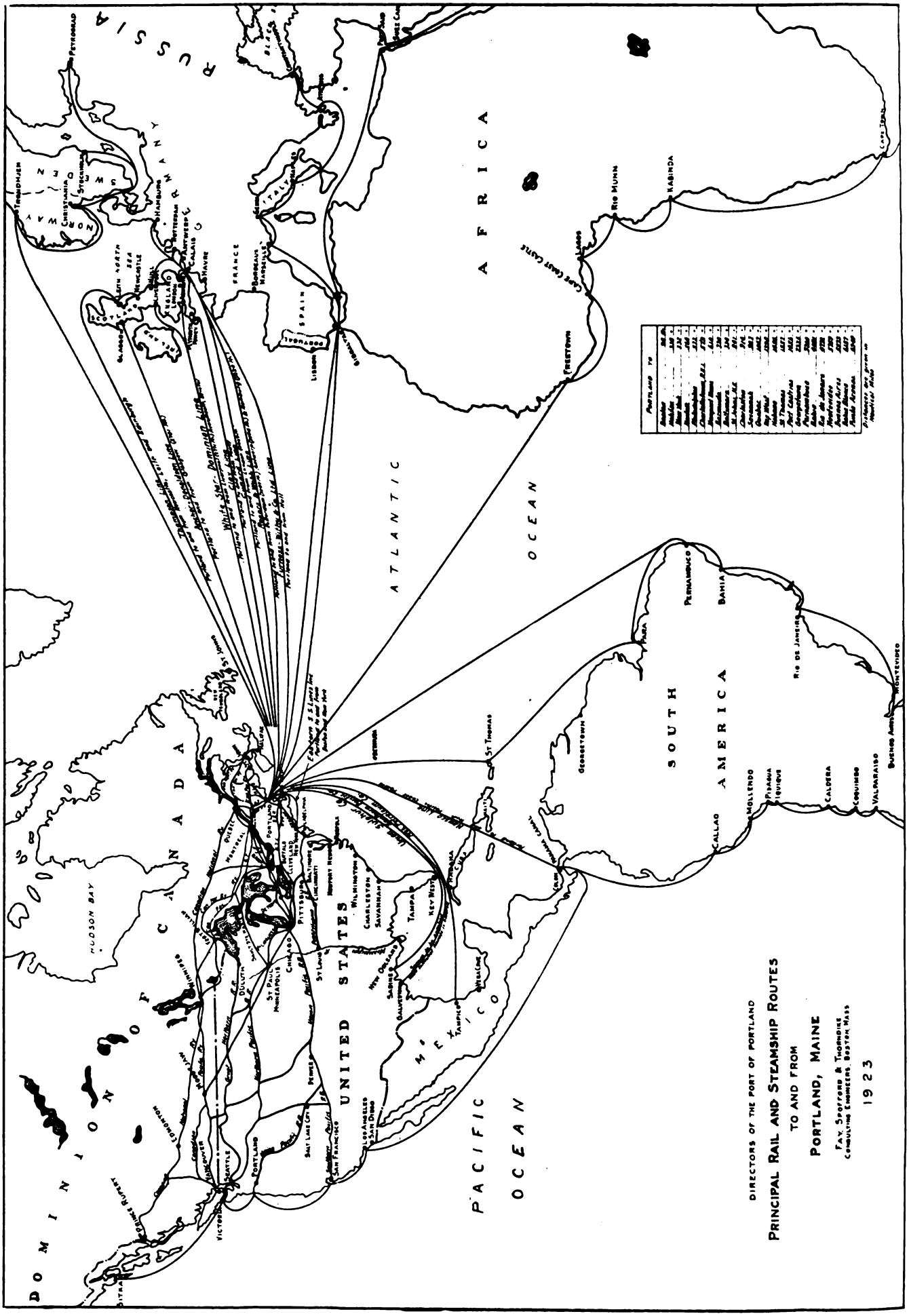

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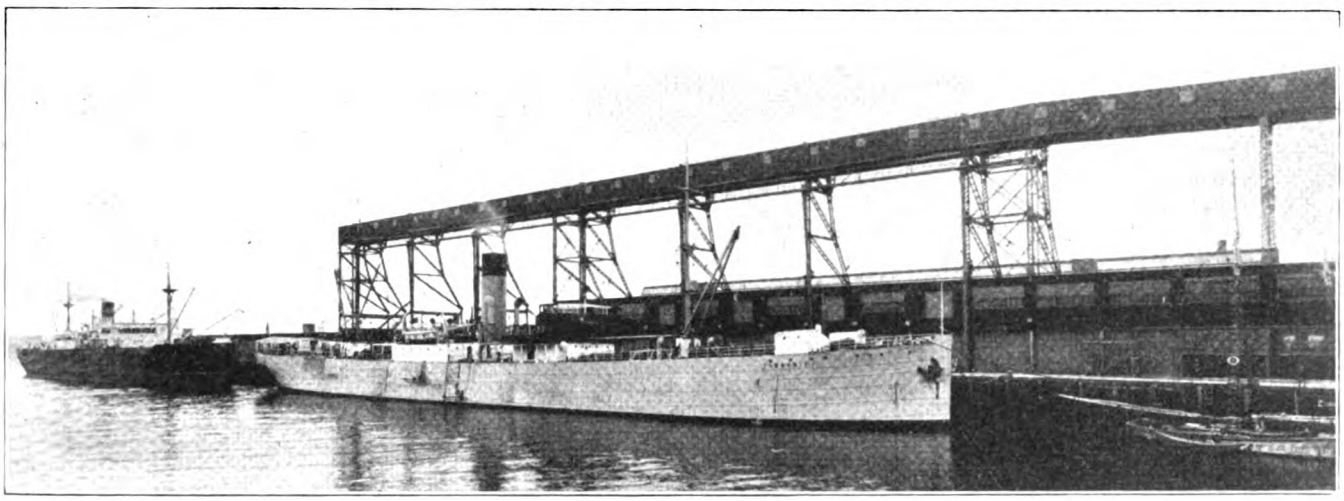
Dock Management Progress Section

How Successful Dock Operators Have Met Problems of Giving Best Service to Ships



State pier, Portland, Me.—Looking west—One of two steel storage sheds—Overhead bulk grain conveyor

Maine's New Modern Pier Pays Well

BY H. R. SIMONDS

ONE of the leading industries of Maine is the manufacture of paper. It was built up when wood for pulp was plentiful in the Southwestern district. As the country's consumption of paper increased year by year it was necessary to go farther and farther back into the northern districts of the state for an adequate source of supply of wood for pulp, until recently the expense of getting the raw material to the paper mills threatened the life of the industry. Investigation showed that foreign pulp was available in large quantities from the Scandinavian countries, but the combined ocean freight, port charges, and railway transportation to the mills made its use economically prohibitive.

Coincident with the investigation by paper manufacturers into the pulp supply, other interests in the state of Maine, principally the business men of Portland, studied the idea of a state owned pier. The critical situation in regard to a supply of raw materials for the paper manufacturers was a strong factor in making the pier project a reality. And since its completion the pier has fully demonstrated its value to this industry, as well as to many other industries of the state.

Maine in 1924 consumed 1,234,172 cords of pulp wood, or more than any other state. An important part of this large total was brought into the new state pier from Europe, Canada, and the northern ports of Maine. The pier directors by appealing to the railroads were able to get them to absorb a portion of the freight on through traffic. By providing wharfage space, facilities for unloading and handling bulk commodities, and ample low cost storage accommodations, the directors were able to make further reductions in the total freight charges on pulp and other raw material required by Maine's industries.

American Ships Needed To Use Our Ports

In recent years there has come about a truly remarkable development of ocean terminal facilities in the United States. The comparatively new state owned pier at Portland, Me., described in this article, is a typical example. Where industries are directly hampered by obsolete inadequate and inefficient terminals the progressive enterprising spirit of the section affected comes into play. When the business men of the country finally become convinced as in time they must, that a fair percentage of American owned and operated ships to use these modern facilities will help industry to grow and expand, the future of our merchant marine will be much brighter.

It is one thing to have a state pier in operation, but it is an entirely different matter to have a state pier which shows a profit on its investment. Disregarding the cost of the land, which was donated by the city, and which is undoubtedly indirectly earning a fair rate of interest in return, the pier itself showed a profit of approximately $100,000 in its operation in 1925. Some idea of the increase in the amount of wood pulp handled may be gained from the fact that during 1923 57,000,000 pounds were received at the pier, while during 1924 the pier handled over 150,000,000 pounds, an increase of nearly 300 per cent.

The pier itself, designed by Fay, Spofford & Thorndike engineers of Boston, is a fine example of modern terminal development. Equipment includes four electrical escalators, two piling cranes, a portable piler, two power trucks with ten trailers, and seven station booms. The pier which has 6500 feet of standard gage trackage, all depressed to facilitate loading and unloading, is 1000 feet in length, 144 feet wide at its outer end, and has a minimum depth of water on its east side and on part of its

(*Continued on Page* 86)

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Equipment Used Afloat, Ashore

Oxy-acetylene Torches for Cutting and Welding Save Time in Steel Ship Repairs—Much Easier on Labor

RIVER boats are built with the idea that they will still be plying the streams when the ferry across the River Styx quits operating. Oldtimers along the banks point with pride to the fact that such-and-such a boat "hasn't missed a trip in the last 25 years."

Such schedules can, of course, only be met by vessels honestly constructed of first-class materials, carefully maintained in good working condition. It is in the every-day business of maintenance that ox-welding and cutting play such important parts.

As an instance, deck plates require much attention. The wear and tear of heavy cargo, moved here and there, add to the slower, more insistent waste by corrosion. Every so often the entire deck must be replaced.

First comes the job of removing the old metal. The old way of sledging off all the rivet heads was a very tedious and costly operation. With the cutting blowpipe it becomes relatively easy. Where rivets are thick, a good operator can cut off 300 heads per hour and keep it up all day, which is much quicker and easier than by the old method of sledge and chisel.

With the rivets free, the old plates can then be lifted out without much trouble. If a plate clings fast at some point, the cutting blowpipe is brought into play again to release it.

Next, the new plates must be fitted. Here again, the cutting blowpipe is invaluable. Detail drawings of the various parts are never at hand —everything must be cut to fit on the job. Many trips back and forth from hull to shears are saved by the use of the blowpipe. Furthermore, many repair companies are located along river banks, in outlying districts, and consequently are not near structural steel yards.

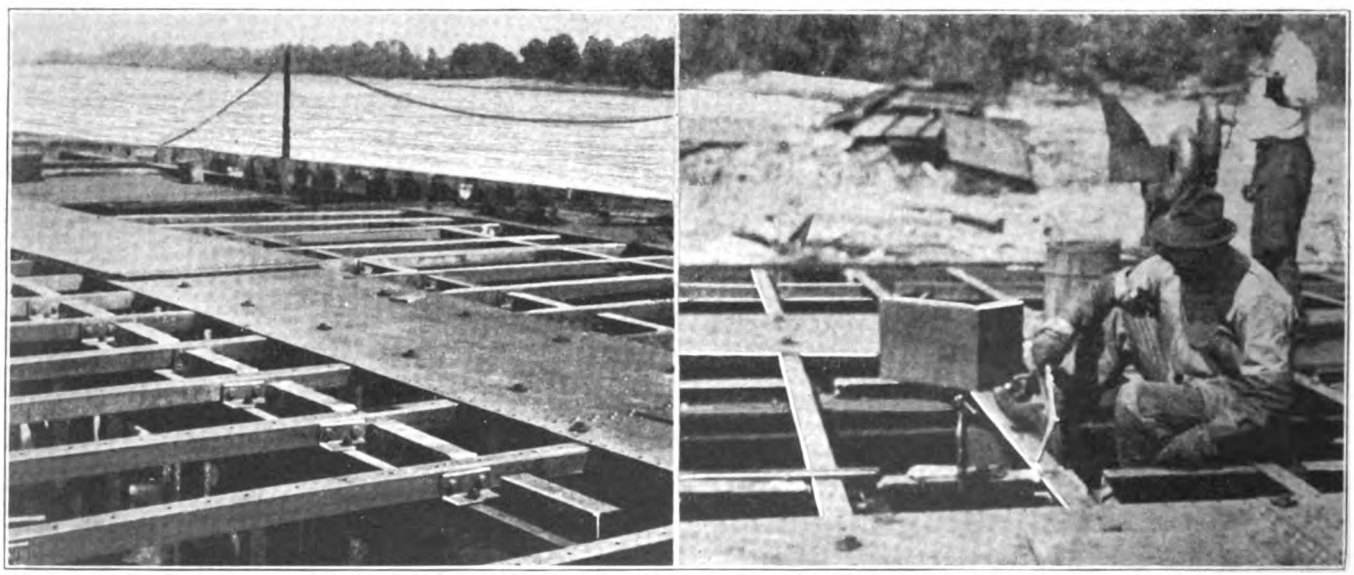
It is therefore frequently necessary to make use of material already on hand for a rush repair and to alter it to suit needs of the job.

The accompanying illustrations furnish an example of how the welding and cutting blowpipes greatly simplified a costly and difficult repair job on the deck of a Mississippi river barge. After the old worn-out deck had been cut up with the blowpipe, it was decided that additional bearing plates should be placed between the main transverse beams. The purpose of these plates was to lend rigidity to the new deck plates, increase the allowable cargo load per square foot, and thus increase the profits from each trip.

It so happened that there were short sections of channel iron to act as braces placed at regular intervals between the transverse angle irons, as shown in the illustrations. But the tops of the channels were too low to

(*Continued on Page* 80)

RENEWING THE DECK ON A MISSISSIPPI RIVER BARGE



(LEFT)—DECK REMOVED SHOWING INTERCOSTAL CHANNNELS DEPRESSED BETWEEN DECK BEAMS—(RIGHT)—USING THE OXY-ACETYLENE WELDING TORCH TO TACK LINERS ON THESE CHANNELS TO MAKE THEM FLUSH

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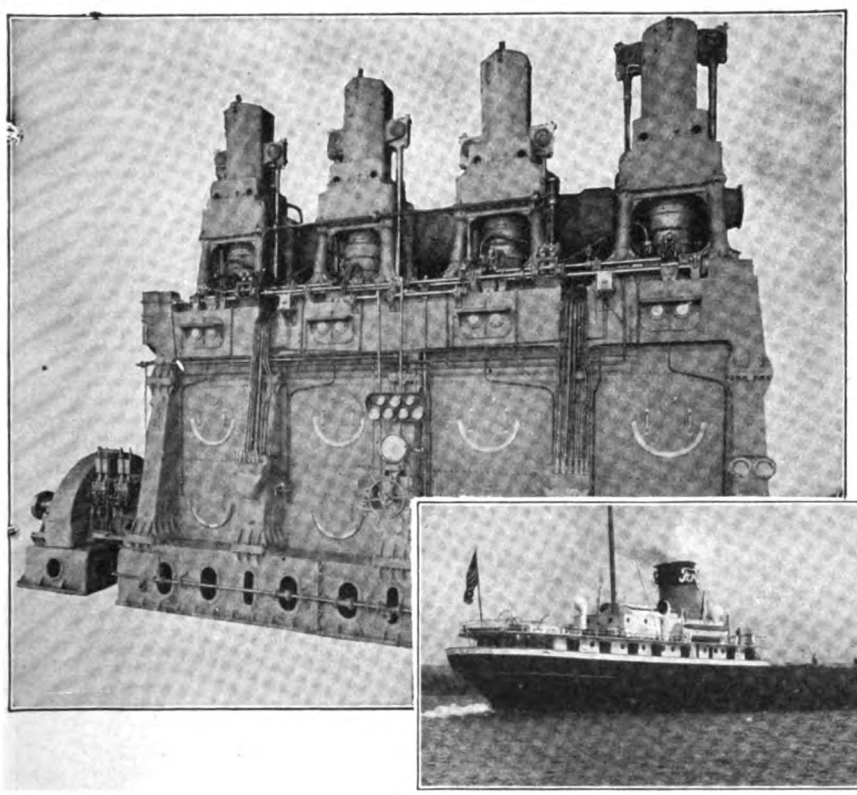
SUN SHIPBUILDING & DRY DOCK COMPANY

Builders of

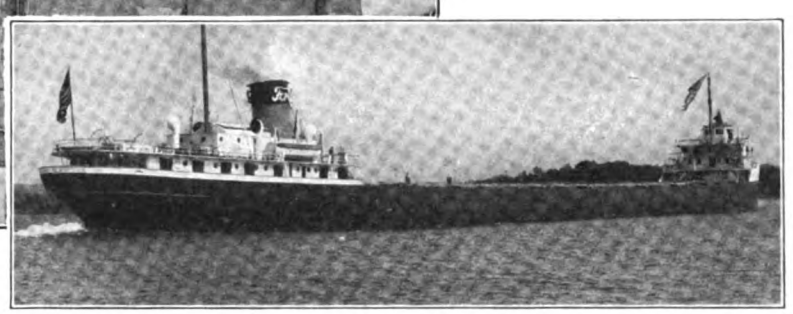
SUN-DOXFORD DIESEL ENGINES

The Engines that Power

"HENRY FORD II" *and* "BENSON FORD"



3000 S.H.P. Sun-Doxford Diesel Engines power the two motorships, "Henry Ford II" and "Benson Ford".



M. S. "Henry Ford II"

SUN-DOXFORD *and* JUNKERS PATENTS

Main Office and Works:
Chester, Pa. - U. S. A.

Philadelphia Office:
Finance Building

New York Office:
Cunard Building

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From the Old Log Book

Stray Items About the Great Lakes, Atlantic, Pacific and Gulf Coasts and Inland Rivers from MARINE REVIEW Files of 10, 20, 30 and 42 Years Ago

APRIL 1884

THE complete cost of building an especially fine new powerful tug, designed by Frank E. Kirby, of the best white oak, 82 feet long by 19 feet 6 inches wide by 11 feet deep with an engine of 175 horsepower, we are told in the April 17, 1884 issue of the *Marine Record* (then the name of MARINE REVIEW, and a weekly) was $15,000. This tug was built for J. S. Dunham of Chicago for use in connection with an elaborate wrecking outfit.

* * *

A dollar evidently meant a good deal more then than it does now. Easily four times this amount would have to be expended today for a boat of equal size and power. Incidentally this account of 42 years ago said that Frank E. Kirby of Detroit had the reputation of being the best marine architect in the country. Mr. Kirby's latest well-known work was the design of the GREATER BUFFALO *and* GREATER DETROIT, *the largest and most luxurious passenger steamers ever constructed on the Great Lakes. These two vessels costing together about* $7,000,000 *came out in* 1924 *and are the masterpieces of his long career in which he has designed and supervised over* 150 *steamers.*

* * *

Memories of the beginning of our modern navy are revived by the brief notice given that the dispatch boat Dolphin, built at Roach's yard in Chester, was successfully launched. Among those present to witness the launching were Secretary of the Navy Chandler, Admiral Mullaney and other officers of the navy. We are told that Mr. Roach, personally, was complimented on the fine appearance of the ship.

APRIL 1896

DEEP places in the ocean have been discovered from time to time. The British warship PENGUIN, it was reported in MARINE REVIEW, April 2, 1896, had reached bottom at 5155 fathoms, while engaged in making deep sea soundings between Tonga and New Zealand. The item went on to say that the deepest sounding previously was made by the American warship TUSCORORA, off the Northeast coast of Japan, when bottom was reached at 4655 fathoms.

* * *

The beginning of the movement for a tank at the navy yard in Washington, was noted 30 *years ago in* MARINE REVIEW. *A bill was then before congress which in substance directed the secretary of the navy to establish a model tank with all proper appliances for the purpose of investigating and determining the most suitable and desirable shapes and forms to be adopted for United States naval vessels. It was also provided that experiments should be made for private shipbuilders at this model tank upon the authority of the secretary of the navy, provided the shipbuilder or shipowner paid the actual cost of material and labor.*

* * *

It is interesting to note that shortly after this time the model basin at Washington became a reality. It was largely worked out by the then Commander, D. W. Taylor, of the construction corps who for many years after this was in charge of the model basin and did not leave this work until during the World war when he was appointed chief constructor of the navy.

APRIL 1906

AN INTERESTING account in MARINE REVIEW for April 5, 1906, shows an outboard profile and midship section of the steamer HENDRICK HUDSON. This steamer was launched on March 31, 1906 at the shipyard of Thomas S. Marvel, Newburg, N. Y., for the Hudson River Day Line. The vessel was christened by Miss Catherine Olcott.

* * *

It is interesting to note that though this event occurred 20 *years ago, the customary bottle of champagne in the christening was missing and instead a bottle containing water was broken over the bow, while at the same time a number of doves were liberated, according to Japanese custom. The account goes on to say that the* HENDRICK HUDSON *was the largest river steamer in the world and that she was designed by Frank E. Kirby. Associated with Frank E. Kirby, in her design, were J. W. Millard and Andrew Fletcher. This steamer is* 400 *feet long,* 82 *feet beam and* 14 *feet deep and she continues to operate on the Hudson river as one of the finest examples of naval architecture, truly American in every way in its origin.*

APRIL 1916

THE feeling aroused by the terrible accident to the EASTLAND when she overturned at Chicago with a loss of so many women and children made the general public eager to fix the responsibility on someone. There was a great hue and cry for a victim or scapegoat. Judge C. W. Sessions of the federal district court of Michigan, we are told in the April 1916 issue of MARINE REVIEW said in part: "The dead cannot be restored to life. The sorrow of the living cannot be lessened by claiming other victims. The majesty of the law cannot be upheld and vindicated by forcing men from their homes to stand trial among strangers upon accusation which there is barely a scintilla of proof to sustain. The evidence in this matter wholly fails to establish probable cause for believing any of these defendants guilty of any crime charged in the indictments. The application for a warrant of removal will be denied."

* * *

Under the heading of "A Lesson in Patriotism" the selling for junk of the famous frigate Portsmouth, one of the last survivors of the wooden navy, was condemned by Marine Review of ten years ago. The suggestion was made that these famous old ships should be given a naval funeral, rather than to sell them, quoting from Oliver Wendell Holmes:

Nail to the mast her holy flag,
Set every thread-bare sail!
And give her to the god of storms,
The lightning and the gale.

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In Emergencies at Sea Trustworthy Rope Must Play a Part

The Antinoe, sinking in a heavy storm — crackle of wireless and a great liner speeding to the rescue — the life boat sent away. In such romances of the sea trustworthy rope must play a part.

You can always trust Plymouth Rope. Brute strength and resistance to weather and abrasion are basically built into it by the conscientious expertness of America's largest and oldest rope-making organization. Since 1824, Plymouth Rope has served American shipping with ability and success, and has grown thru the widespread appreciation of the merits of Plymouth quality.

Every Plymouth product represents the uniform result of an unequaled supply of raw materials, handled intelligently and worked by experts on specially developed machines. They are made under a fixed policy of first-quality goods only.

These things are your guarantee of the superior quality of Plymouth Cordage.

Ship Chandlers everywhere handle Plymouth Cordage.

Plymouth Cordage Company
North Plymouth, Mass. Welland, Canada

PLYMOUTH *The Rope You Can Trust*

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What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

NEW CLYDE shipbuilding work reported in February, added to that announced in January, make a larger total for the two months than in any previous period of similar length. The vessels launched all over Scotland during February numbered 15 and measured 35,377 tons. The Clyde total for the two months consisted of 25 vessels of 50,999 tons as compared with 20 vessels of 69,502 tons in the same period last year. It was intimated during February that William Beardmore & Co. Ltd., Dalmuir were to build, not only a light cruiser of 10,000 tons for the Admiralty and the propelling machinery (not yet officially confirmed) of a large Lloyd Sabaudo liner which has been ordered from a Trieste firm, but also three twin-screw passenger and cargo motorships, each 370 feet in length, 52 feet in breadth and 26 feet 9 inches in depth for propulsion by Beardmore—Tosi internal combustion engines, for the Companhia Nacional de Navegacao Costeira, of Rio de Janeiro. A. M. Millan & Son Ltd., Dumbarton have obtained from the British & African Steam Navigation Co. (Elder Dempster & Co.) Liverpool an order for four single screw motorships, 355 feet in length for propulsion by Burmeister and Wain 4-cycle internal combustion engines made by Harland & Wolff Ltd., Glasgow.

* * *

ADDRESSING the chamber of shipping of the United Kingdom, Walter Runciman, M. P., president denounced state control of shipping. This gigantic engine for international service and the payment of British supplies was the direct outcome of enterprise in which capital and profits played a potent part. The state had never created a single item of foreign trade, and had never organized a single foreign service. He continued: "Tampering with the delicate adjustments of international trade produced bad results more quickly in shipping than in any other industry. Whatever may be thought of the possibility of state ownership and organization of manufacturing and mining industries no sane man has yet suggested that British shipping employed in foreign trades should be run as a state concern. The experience of the United States of America, Australia and Canada all goes to show that in international trade state departments no matter how well they are manned are incapable of keeping their financial heads above water in the fresh breezes of international competition."

* * *

OTHER contracts reported during February were: Robert Duncan & Co. Ltd., Port Glasgow to build two cargo steamers each of about 9000 tons deadweight, for Glover Brothers, London; the Ayrshire Dockyard Co. Ltd., Irvine, two cargo steamers, each of 5700 tons deadweight for H. Hogarth & Sons Glasgow and Ardrossan; John Fullerton & Co., Paisley, two coasting steamers for Irish owners; Lobnitz & Co. Ltd., Renfrew, a powerful dredger for the service at Hull of the London & North Eastern railway, Alley & M'Lellan Polmadie a screw tug, 61 feet in length, Henry Robb Ltd., Leith, two self-propelled hopper barges, each with a hopper capacity of 600 tons, for the service

(*Continued on Page* 78)

What's Doing Around The Lakes

ICE conditions were easy at the southern end of Lake Michigan from Christmas until the third week of March, when unfavorable winds piled up big fields along the eastern shore. Efforts of the Goodrich Transit Co., Chicago, to re-establish service from Chicago to Benton Harbor and St. Joseph, Mich., were frustrated several times when the ILLINOIS could not get through.

* * *

THE 11 steamers of the Goodrich Transit Co. fleet are receiving their customary spring overhauling at Manitowoc and Benton Harbor. No major changes are contemplated this year. The ALABAMA is scheduled to go off her run the middle of April to be repainted and receive her summer wheel at Manitowoc. The spring schedule of the Goodrich fleet will take effect May 15.

* * *

THE Peninsula & Northern Navigation Co., Milwaukee, placed the INDIANA of the Goodrich fleet under charter in March while the ARIZONA was undergoing repairs. The INDIANA then went on the Chicago-Milwaukee run, replacing the ILLINOIS, which was put on the Chicago-Benton Harbor-St. Joseph run.

* * *

THE first sailing of the Great Lakes Transatlantic Steamship Line from Chicago to European ports is scheduled for April 17. Lake Erie ports will be touched if dock facilities and cargoes are available.

* * *

CAPT. ELIAS GUNNELL, one of the founders of the Manitowoc Shipbuilding Corp., Manitowoc, Wis., and for a number of years identified with the Maritime Securities Co. and Goodrich Transit Co., Chicago, died, Feb. 25, aged 60. He was at one time associated with the Wheeler Shipbuilding Co., Bay City, Mich., and the Chicago Shipbuilding Co., Chicago. His loss is keenly felt.

* * *

CAPT. ROBERT YOUNG, manager for the Dunham Towing & Wrecking Co., and for many years a vesselman on the Great Lakes, died at his home in Park Ridge, Ill., a suburb of Chicago, March 7. He was on the KEARSARGE when she fought the ALABAMA off the coast of France in 1864. In 1916 he raised the EASTLAND following the disaster in the Chicago river.

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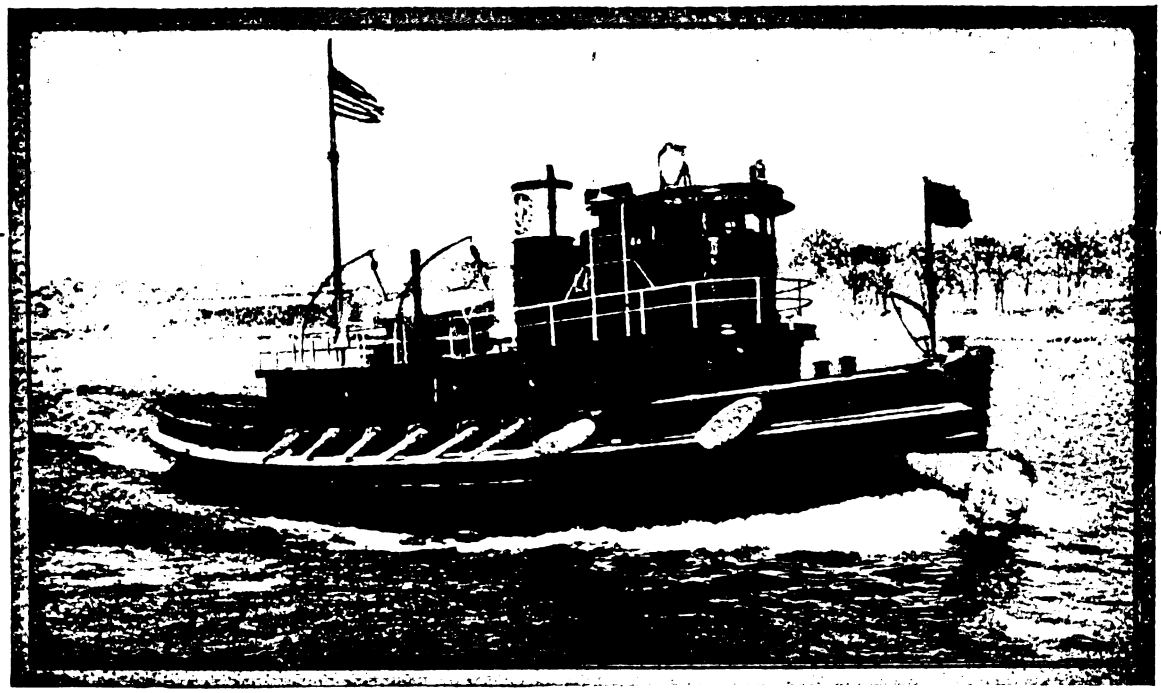

The tug, "Lion," owned by the Transmarine Corporation, New York City. Length over-all, 103'—beam 26'—draft 12'.

In continuous, 24-hour service for more than a year

HERE is another example of the all-around efficiency of the Nelseco Diesel engine!

The tug, "Lion," powered with a 600 S. H. P. Direct Reversible Nelseco Diesel engine in January 1925, has been in continuous operation since that date. There have been no shut-downs—no repairs and only slight delays for refueling.

This vessel handles general towing service in New York harbor and is manned with double crews. With a fuel capacity of 14,000 gallons of oil and a fuel consumption of less than 500 gallons in 24 hours, this tug can operate for approximately a month without refueling.

Write for pamphlet M R which describes this installation and which explains the distinctive features of the Nelseco Diesel engine.

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Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	404	1,591,273	454	1,826,886
January	407	1,671,761	463	1,883,094
December	431	1,706,900	510	2,022,775
November	473	1,902,745	488	1,886,587
October	450	1,920,797	530	2,229,801
September	449	1,960,366	505	2,117,563
August	469	1,889,239	493	1,933,228
July	457	1,813,388	547	2,130,581
June	521	2,177,995	507	2,103,914
May, 1925	435	1,820,544	538	2,215,561

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	78	184,715	52	113,763
January	76	206,081	52	136,040
December	83	194,283	53	142,885
November	83	216,604	44	116,468
October	74	193,534	49	128,906
September	85	211,019	51	113,257
August	84	197,743	65	146,144
July	96	241,244	57	131,400
June	107	260,756	67	165,940
May, 1925	87	209,866	63	155,359

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	92	263,475	42	136,613
January	97	287,335	55	156,167
December	96	270,869	67	210,652
November	115	341,258	59	147,554
October	105	312,455	73	206,347
September	114	328,275	78	196,632
August	136	349,514	104	246,275
July	140	336,982	115	283,558
June	161	368,009	111	213,985
May, 1925	118	296,551	93	205,291

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	23	64,150	23	66,660
January	26	78,508	27	81,917
December	31	85,651	29	75,072
November	25	35,616	23	33,194
October	17	27,630	20	34,668
September	19	36,082	22	45,258
August	16	37,391	17	36,191
July	23	48,916	23	54,903
June	26	37,668	23	38,892
May, 1925	23	42,242	27	47,648

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	8	29,622	7	30,033
January	5	20,355	6	24,221
December	16	52,660	6	27,149
November	6	16,446	8	26,811
October	9	35,405	6	21,232
September	7	21,260	7	22,410
August	8	14,019	5	17,041
July	12	34,835	9	27,767
June	8	34,034	7	28,575
May, 1925	15	40,589	9	27,016

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	23	81,440	33	114,147
January	22	84,722	26	97,068
December	23	86,443	40	144,392
November	28	108,796	37	140,784
October	26	98,371	41	144,397
September	28	103,812	43	158,098
August	16	62,202	23	81,712
July	15	56,181	23	79,132
June	19	64,684	26	85,839
May, 1925	11	47,728	20	77,847

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	102	304,714	99	288,640
January	97	302,341	88	264,249
December	105	314,958	108	332,721
November	106	334,997	99	312,705
October	99	302,522	92	293,425
September	93	264,455	109	310,029
August	109	319,469	104	319,035
July	115	345,191	123	350,875
June	118	348,571	121	353,738
May, 1925	118	341,793	129	379,956

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	20	48,377	108	298,756
January	26	69,958	96	256,019
December	24	57,907	100	279,570
November	27	78,573	81	254,439
October	26	51,328	91	248,017
September	39	94,940	85	237,623
August	70	183,064	122	348,475
July	61	163,764	131	347,756
June	81	221,318	152	433,953
May, 1925	63	159,186	140	376,657

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1926	38	103,029	38	106,472
December	37	101,726	35	91,141
November	37	112,158	38	117,064
October	45	125,766	47	126,452
September	50	137,030	39	103,408
August	34	77,027	39	87,455
July	38	97,332	34	91,981
June	26	60,788	27	60,924
May	27	71,946	22	65,595
April, 1925	39	106,938	36	59,574

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	70	85,607	69	88,229
January	80	110,684	81	110,084
December	89	121,193	88	113,996
November	96	113,222	89	107,091
October	77	91,125	75	90,953
September	76	96,356	73	91,119
August	72	90,106	70	87,924
July	77	94,002	76	91,264
June	87	95,533	85	95,397
May, 1925	104	119,502	103	119,729

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	100	153,884	92	188,057
January	109	212,005	78	150,384
December	104	183,941	89	173,371
November	101	191,490	95	185,722
October	88	258,529	84	161,648
September	80	149,289	76	171,432
August	83	172,872	75	152,613
July	89	180,488	80	160,739
June	86	161,215	79	156,160
May, 1925	95	193,841	89	172,419

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1926	45	182,889	50	204,058
December	47	201,460	55	231,787
November	47	199,055	46	196,343
October	52	203,951	49	207,153
September	42	173,157	43	183,917
August	31	135,105	35	144,874
July	32	137,319	28	130,875
June	34	143,655	41	174,668
May	28	132,043	39	138,570
April, 1925	41	156,761	42	173,116

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	255	717,048	250	691,747
January	241	659,776	243	652,209
December	273	750,625	279	764,022
November	261	645,709	232	629,728
October	252	729,058	276	789,419
September	248	655,867	248	680,446
August	257	675,405	253	664,064
July	265	673,711	262	648,474
June	268	679,277	249	609,807
May, 1925	256	666,503	276	724,621

Houston

(Cargo tonnage)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1924	99	39,568	102	154,455
November	101	36,016	95	233,436
October	..	34,945	...	192,986
September	94	50,710	90	171,229
August	82	66,665	84	114,966
July	59	77,062	57	288,417
June	65	74,794	72	336,312
May	72	64,937	71	362,350
April	78	76,466	73	337,757
March, 1924	88	113,064	87	411,715

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	39	89,426	71	208,388
January	36	92,194	75	235,699
December	38	83,590	97	300,872
November	34	107,440	83	266,458
October	43	98,168	96	302,581
September	33	95,954	72	225,194
August,	28	80,524	41	133,058
July	36	100,359	52	141,316
June	47	120,423	57	177,647
May, 1925	46	114,702	53	151,098

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	119	363,875	111	306,161
January	130	381,785	115	335,041
December	149	392,707	109	310,852
November	181	398,459	123	337,483
October	261	365,552	183	268,611
September	115	284,493	205	259,437
August	161	344,646	160	295,220
July	133	326,692	119	285,624
June	162	382,186	102	278,294
May, 1925	168	363,843	138	298,066

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
January, 1926	154	544,882	139	528,315
December	135	532,691	153	593,556
November	124	491,579	142	547,770
October	138	517,798	136	511,844
September	135	487,872	144	535,301
August	154	579,197	154	549,844
July	138	517,798	136	511,844
June	135	514,900	96	464,024
May	163	567,001	145	554,483
April, 1925	134	472,879	157	517,654

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
February, 1926	21	65,930	32	70,814
January	23	75,232	32	108,118
December	31	86,254	24	71,883
November	40	117,506	42	120,597
October	30	86,652	32	95,695
September	26	101,387	31	88,654
August	22	66,176	23	68,827
July	27	89,956	34	100,395
June	26	67,251	30	83,972
May, 1925	28	105,707	42	122,871

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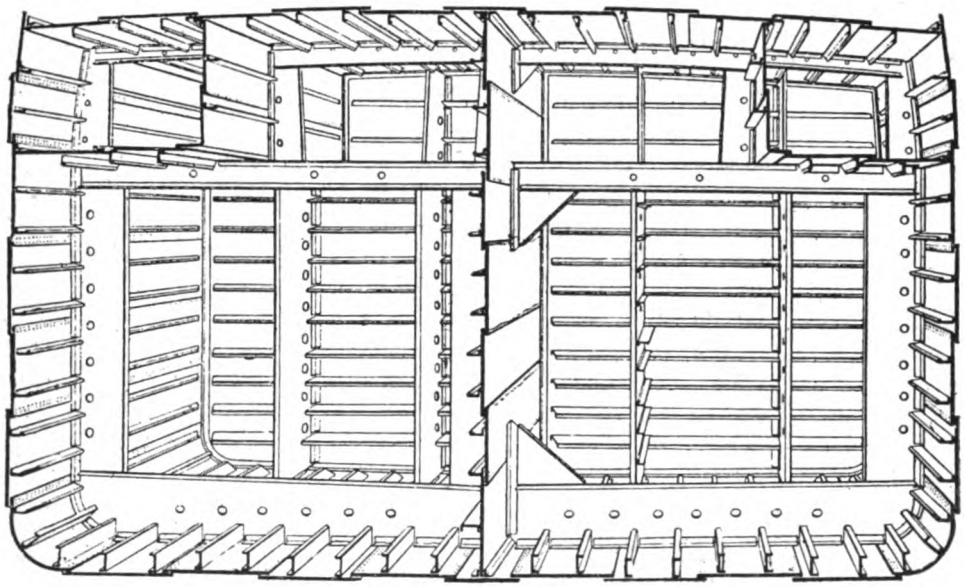

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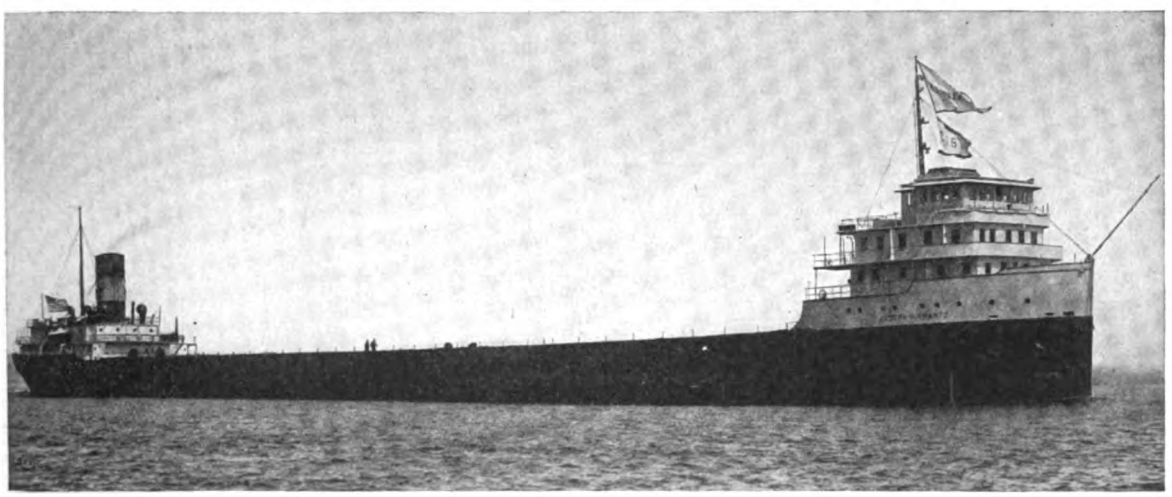

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British Are Doing

(*Continued from Page 74*)

at Garston of the London, Midland & Scottish railway; Caledon Shipbuilding & Engineering Co. Ltd., Dundee, two passenger ferry steamers for the Mersey service of the Wallasey borough council, and also two Admiralty crane pontoons.

* * *

DETAILS are now available relative to the two last cruisers ordered for the 1925-26 program. One of these has been ordered from R. & W. Hawthorn, Leslie & Co. Ltd., Newcastle on Tyne, and the other will go to William Beardmore & Co. Ltd., Dalmuir, when certain details have been adjusted. Over 40 per cent of the ordinary shares in Beardmores are held by Vickers Ltd. These conclude the program of four cruisers embraced in this year's program and belonging to the "County" class. All these vessels come under the restrictions as to displacement tonnage and caliber of guns laid down by the Washington conference. They are, therefore, of 10,000 tons displacement and the limit of the caliber of the guns is eight inches. It is considered probable that a higher steam pressure than in former ships has been adopted. Already with the destroyers the Admiralty have gone as far as 350 pounds per square inch, and if still higher or similar pressure is adopted in the later cruisers, the weight of machinery will be reduced, while at the same time the oil fuel capacity can be made less, leaving a margin as compared with the previous ships if the radius of action is maintained.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to March 18, 1926 on Future Loadings

NOTE: FREIGHT RATES STEADY WITH BUSINESS FAIR

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel	REMARKS Freight	REMARKS Offered
Liverpool	1s 6d	$0.50	$0.30	0.18	$0.40	$0.75	$7.00T		Dull
London	1s 6d‡	0.50	....	0.20	0.40	0.75	7.00T		Dull
Oslo	$0.13	0.45	0.50	0.27	0.42½	0.85	7.00T		Poor
Copenhagen	0.13	0.45	0.40	0.26	0.42½	0.85	7.00T		Poor
Hamburg	0.08	0.35	0.35	0.18	0.37½	0.75	8.00T		Dull
Bremen	0.10	0.35	0.40	0.18	0.37½	0.75	8.00T		Good
Rotterdam and Amsterdam	0.12	0.32½	0.45	0.18	0.35	0.70	7.50T		Good
Antwerp	0.08	0.32½	0.35	0.18	0.35	0.70	7.50T		Poor
Havre	0.10	0.50	0.35	0.27½	0.40	0.75	8.00T		Slow
Bordeaux	0.10	0.50	0.35	0.27½	0.40	0.75	8.00T		Slow
Barcelona	....	12.00T	0.30	10.00	—12.00T—		8.00 to 15.00T		Fair
Lisbon	0.20	0.65	0.40	7.00T	—20.00T—		7.00T		Poor
Marseilles	0.15	0.55	0.30	6.00	—20.00T—		5.00T		Poor
Genoa	0.12	12.50	0.40	7.00	—20.00T—		10.00T		Fair
Naples	0.12	12.50	0.40	7.00	—20.00T—		10.00T		Fair
Constantinople	0.27	17.00T	0.75	0.40	—20.00T—		9.00T		Fair
Alexandria	....	17.00T	0.96	0.40	—20.00T—		9.00T		Fair
Algiers	....	0.75	0.50	0.40	—20.00T—		7.00T		Poor
Dakar	....	15.00	....	14.00T	—21.00T—		10.50T		Good
Capetown	9.00T	18.00	....	12.00T	—18.00T—		18.00T		Good
Buenos Aires	....	20.00T	....	....	—20.00T†		8.80T		Fair
**Rio de Janeiro	....	22.00T	....	8.00T	20.00 to 22.00T†		7.00 to 7.70T†		Fair
Pernambuco	....	22.00T	....	9.00T	—22.00T—†		9.70T†		Good
Havana	0.35*	0.50	....	0.38*	0.61*	1.33*	10.20*		Very good
Vera Cruz	0.35	0.30	0.35	0.25	0.52½	1.05	0.30 to 0.35		Very good
Valparaiso	....	1.07	....	0.70	0.45	0.80	10.00T		Very good
San Francisco	....	0.40 to 0.70	....	0.50 to 1.10	....	....	0.30 to 1.00		Good
Sydney	....	18.00T	1.25	1.18T	18.00-24.00T		9.00-12.00T		Fair
Calcutta	....	14.00T	0.45	10.00T	—16.00T—		10.00T		Good

T—Ton. ‡Per quarter of 480 lbs. †Landed. ††Heavy products limited in length. *Extra charge for wharfage. **Plus $1.00 surcharge on all rates to Rio de Janeiro on account of congestion.

From North Pacific Ports to	Lumber Per m. t.
San Francisco	$5.00
South California	5.00 to 6.00
Hawaiian Islands	10.00 to 12.00
New Zealand	16.00 to 18.00
Sydney	13.50 to 14.00
Melbourne-Adelaide	13.50 to 14.00
Oriental Ports	11.00 to 12.00
Oriental Ports (logs)	15.00 to 17.00
Peru-Chile	12.50 to 14.00
South Africa	17.00 to 18.00
Cuba	16.00
United Kingdom	75s to 90s
United Kingdom (ties)	70s to 80s
Baltimore-Boston range	$14.00 to 15.00
Florida Range	16.00 to 17.00
Buenos Aires	14.00
Flour and Wheat	
U. K. and Continent (gross ton)	30s to 33s 6d
Oriental Ports (net tons)	$4.25 to 4.75

Principal Rates To and From United Kingdom

	s	d		s	d
Grain, River Plate to United Kingdom	13	6	Pig iron, United Kingdom to New York or Philadelphia	9	6
Coal, South Wales to Near East	12	9	Iron ore, Bilbao to Cardiff	6	3
Coal, United Kingdom to Buenos Aires	19	3	Iron ore, Huelva to Phila. or Balto	11	0
Manganese Ore, Poti to Philadelphia	$3.90				

NOTE: Lighterage rates on fuel in New York reduced from 6½ to 5½c per barrel.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
June 4, 1925	5.00@6.00	1.86½	5.50c
July 20	4.90@6.00	1.75	5.50
Aug. 17	5.00@6.00	1.71½	5.50
Sept. 19	5.50@6.00	1.71½	5.00
Oct. 17	5.00@6.00	1.70½	5.00
Nov. 18	5.50@5.60	1.70½	5.00
Dec. 18	5.60	1.70½	5.00
Jan. 2	5.50@6.25	1.75@1.80	5.25
Mar. 18, 1926	5.60@5.80	1.80½	5.50

At Philadelphia

	Coal trim. in bunk per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
July 20, 1925	4.90@5.50	1.69@1.81½	5.15@5.43c
Aug. 17	5.00@5.80	1.56@1.71½	5.15@5.29
Sept. 19	5.25@5.50	1.55@1.61½	5.00
Oct. 17	5.25@5.50	1.71½@1.74½	5.15@5.65
Nov. 18	5.40@5.65	1.71½@1.74½	5.15@5.25
Dec. 18	5.15@5.50	1.71@1.74½	4.89@5.15
Jan. 20	5.50@6.25	1.71@1.79	5.00@5.65
Feb. 18	5.80	1.78@1.86½	5.14@5.50
Mar. 18, 1926	5.00@5.25	1.80@1.86½	5.40@5.65

Other Ports

Boston, coal, per ton...$7.37
Boston, oil, f. a. s., per barrel...$1.83
Hampton Roads, coal, per ton, f.o.b., piers... 4.60@4.85
March 9—Cardiff, coal, per ton...12s 6d
London, coal, per ton..25s 0d
Antwerp, coal, per ton..21s 6d
Antwerp, Fuel oil, per ton..77s 6d
Antwerp, Diesel oil, per ton...97s 6d
British ports, Fuel oil...72s 6d
British ports, Diesel oil..87s 6d

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Roll down to Brest with the old ensign over us,—
Carry on and thrash her out with all she'll stand.
Rudyard Kipling.

Every sail drawing, rigging, humming,—every seam straining, crowding to get the last knot of speed—a might test for caulking.

Does she spread, and spring a leak, No, sir, for there's

STRATFORD OAKUM

well-caulked in her seams.

Stratford Oakum has been the choice of the experienced for nearly a century. The best shipyards and repair yards use it for a Stratford seam is caulked right and stays tight.

Do not accept a substitute. There is none "just as good".

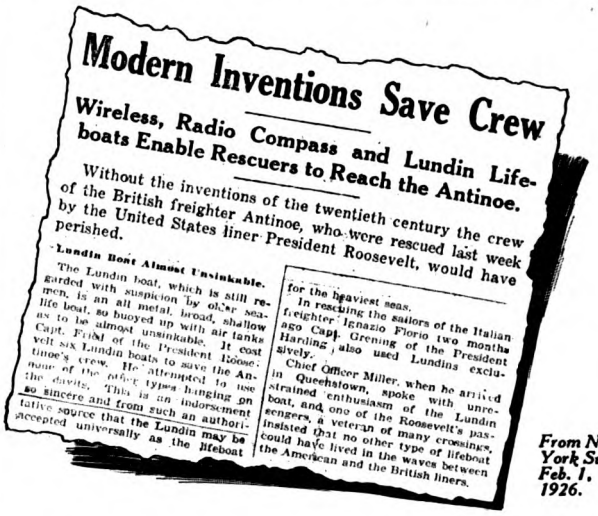
GEORGE STRATFORD OAKUM COMPANY

Jersey City,
New Jersey.

Also manufacturers of Cotton Wiping Waste

*

Lundin Life Boats
Saved Crew of Antinoe



Modern Inventions Save Crew

Wireless, Radio Compass and Lundin Lifeboats Enable Rescuers to Reach the Antinoe.

Without the inventions of the twentieth century the crew of the British freighter Antinoe, who were rescued last week by the United States liner President Roosevelt, would have perished.

Lundin Boat Almost Unsinkable.

The Lundin boat, which is still regarded with suspicion by older seamen, is an all metal, broad, shallow lifeboat, so buoyed up with air tanks as to be almost unsinkable. It cost Capt. Fried of the President Roosevelt six Lundin boats to save the Antinoe's crew. He attempted to use none of the other types hanging on the davits. This is an indorsement so sincere and from such an authoritative source that the Lundin may be accepted universally as the lifeboat for the heaviest seas.

In rescuing the sailors of the Italian freighter Ignazio Florio two months ago Capt. Grening of the President Harding also used Lundins exclusively.

Chief Officer Miller, when he arrived in Queenstown, spoke with unrestrained enthusiasm of the Lundin boat, and one of the Roosevelt's passengers, a veteran of many crossings, insisted that no other type of lifeboat could have lived in the waves between the American and the British liners.

From New York Sun, Feb. 1, 1926.

"THE Lundin boat is an all metal, broad, shallow lifeboat, so buoyed up with air tanks as to be almost unsinkable. Capt. Fried of the President Roosevelt attempted to use none of the other lifeboats hanging on the davits and without the LUNDIN LIFEBOATS, an innovation of the last decade, Capt. Fried might have been forced to stand powerless on the bridge and watch the freighter go down with all hands.

This is a sincere and authoritative endorsement that the "Lundin" may be accepted universally as the lifeboat for the heaviest seas.

In rescuing the sailors of the Italian freighter Ignazio Florio three months ago, Capt. Grening of the President Harding also used Lundins exclusively.

Chief Officer Miller spoke with unrestrained enthusiasm of the Lundin boat, and one of the Roosevelt's passengers, a veteran of many crossings, insisted that no other type of lifeboat could have lived in the waves between the American and British liners."

Welin Davit & Boat Corp.

305 Vernon Ave., Long Island City, N. Y.

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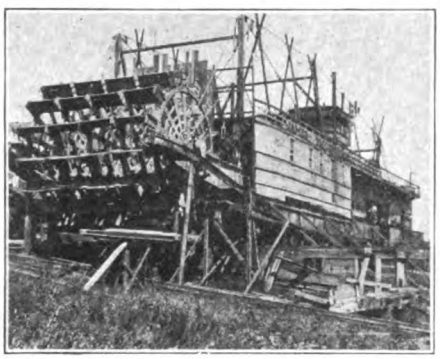
Equipment Used

(*Continued from Page 70*)

support the deck plates directly, therefore shims or liners were necessary. To attach these liners by riveting, it would have been necessary to countersink the rivets on top or to rivet through deck, liner and flange, because the deck plates, of course, had to lie flat. The cost of such drilling, countersinking, bolting, labor, and riveting would have been considerable, so it was decided to weld the plates to the channels.

Hundreds of these liners were to be put in. A helper went ahead clamping the shims to the channels, and an operator followed welding each end. The operator welded both ends of a shim in faster time than the holes in the channel alone could have been drilled, to say nothing of drilling and countersinking the shim. (Incidentally, punches capable of doing this work weren't available at this yard.)



STERN WHEELER JAMES Y. LOCKWOOD HAULED UP FOR REPAIRS

Corrosion also attacks parts of the beams, stanchions, angle irons, and other structural members. It is far quicker and cheaper to cut out these parts by the use of the cutting blowpipe than by sawing. It is then necessary to put in new sections, and here the oxy-acetylene process continues to play an efficient part.

Working space in the hull is usually cramped, and where riveted construction is specified it is often difficult and costly to drill or punch new rivet holes for joining the new parts. Many ship repairmen have solved this problem by laying out the locations of the holes and then piercing with the cutting blowpipe. In such work it is advisable to cut the holes a trifle small and ream them to size in the usual way.

These are some of the many economical uses to which the oxy-acetylene process is adapted in the repair and maintenance of river boats. Literally hundreds of other duties await.

C. P. Wetherbee Retained on Marine Work

Charles P. Wetherbee, well-known marine engineer, has joined the engineering staff of the Westinghouse Electric & Mfg. Co. According to a recent official announcement, Mr. Wetherbee has been retained as consulting engineer on marine work, in which capacity he will be attached to the South Philadelphia works.

He has earned international fame during his thirty years of service with the Bath Iron Works, Ltd., Bath, Me. Beginning his long career at Bath as a draftsman, he rose ultimately to vice president and superintending engineer. The development of the well known Bath designs started with Mr. Wetherbee's close association with Sir John H. Biles of Glasgow and London, naval architect for the Bath Iron Works at that time and J. A. Normand of Havre, recognized throughout the world as the leading designer and builder of torpedo boats.

The development of the turbine for the Bath boats was worked out with Sir Charles A. Parsons of Newcastle on Tyne. The long and personal association with these three eminent marine specialists formed a sound foundation for Mr. Wetherbee's later work and success.

Born in Detroit, Mich., 1871, Mr. Wetherbee after finishing his early school education, entered the Massachusetts Institute of Technology in 1887 from which he graduated in 1891. The same year he was appointed instructor in naval architecture, serving in that capacity until the following year, when he entered the Ecole d' Application du Genie Maritime, Paris, from which he graduated in 1894.

CHARLES P. WETHERBEE

At this time a brilliant group of young American naval officers were receiving their education abroad. Beuret, Woodward, Hasbrouck, Stocker and Snow were in Paris. Ferguson, Watt and Zahn were in Glasgow. Smith and Gilmor were in Greenwich. All these men have risen high in their profession and it was with such a group that Mr. Wetherbee developed.

Shortly after, Mr. Wetherbee was employed at the Newport News Shipbuilding & Dry Dock Co. in the office of the superintending naval constructor, remaining there until 1895 when he obtained a position as draftsman at the Columbian Iron Works, Baltimore, whence he went to the Bath Iron Works in 1896. The principal part of his engineering career has been devoted to the design of machinery installations, especially those involving Parsons marine steam turbines, built by the Bath Iron Works.

Of the vessels built at this yard, naval craft predominated and among those, for the design of whose machinery Mr. Wetherbee was responsible, were the battleship Georgia, the scout cruisers Chester and 25 destroyers. The plans for the last eleven of these destroyers were also chosen by the navy department during the war for the construction of many of the destroyers built at various private and government ship yards.

Elias E. Gunnell 1866-1926

Elias E. Gunnell, former president of the Manitowoc Shipbuilding Corp., Manitowoc, Wis., died unexpectedly at his home in that city Feb. 26. Mr. Gunnell was born in Ireland, near Dublin, 60 years ago. In America, at the age of 21 he was assistant superintendent of a large shipbuilding plant and later was with the Wheeler Shipbuilding Co., Bay City, Mich., and the Chicago Shipbuilding Co. At one time he was superintendent of the Bath Shipbuilding Co., Bath, Me., now being liquidated as the Bath Iron Works. In 1901 Mr. Gunnell, with C. C. West and L. E. Geer, purchased the Manitowoc yards of Burger Bros. During the World war he directed the building and equipment of a fleet of some 50 ships, laying a keel every four weeks.

When the shipbuilding company in 1920 was reorganized under the present corporate name, Mr. Gunnell retired from the presidency and became president and treasurer of the Maritime Securities Co. which handles affairs of the Manitowoc corporation.

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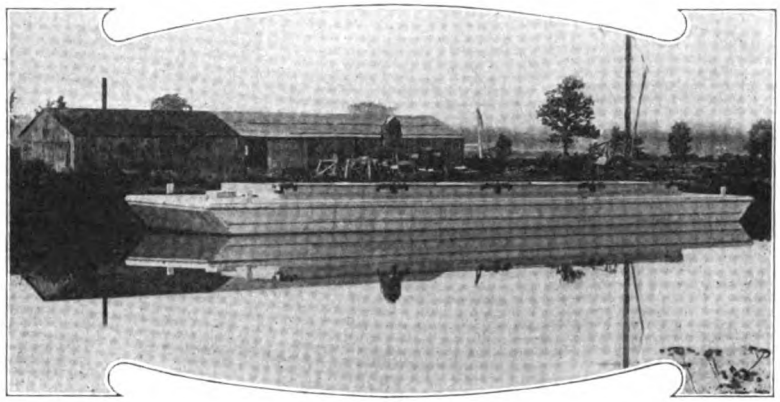
Channel Steel—World's Strongest Barges

Channel steel hopper dump scow, 125 cubic yards capacity—constructed for the State of New York.



Built by

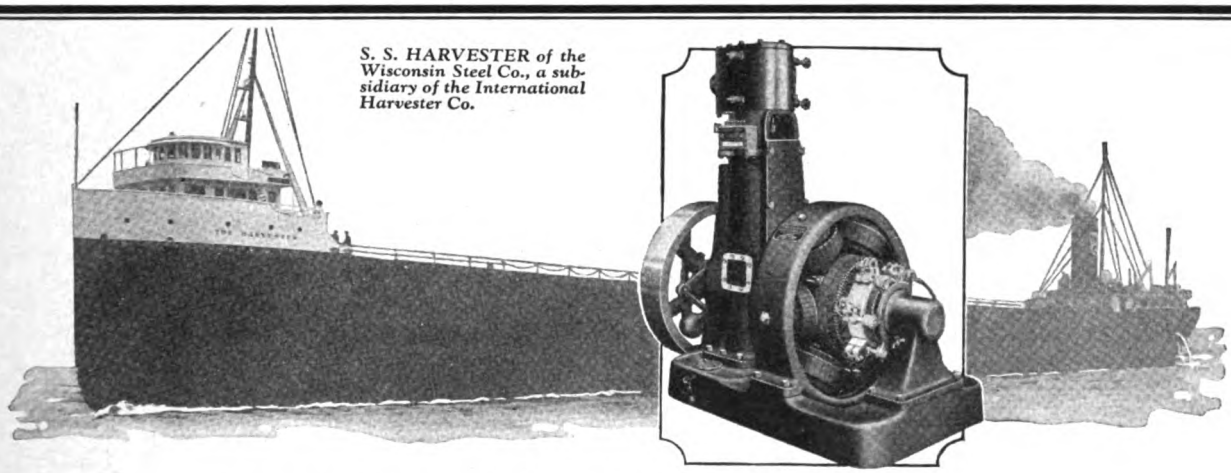
Channel Steel Barge Company, Rome, N. Y.

Pioneers in the building of CHANNEL STEEL HULLS

Designed and Patented by Louis Henley, Rome, N. Y., sole owner of the United States and Canadian Patents, by whom designs will be furnished and builders licensed.

W. G. Bartenfeld, Great Lakes Representative, Lorain, Ohio

Channel Steel Barge Co., Rome, N. Y.



S. S. HARVESTER of the Wisconsin Steel Co., a subsidiary of the International Harvester Co.

Many Valuable, Distinctive Features

THE ENGBERG *Perfectly Balanced Piston Valve* is one. Steam entirely surrounds the valve and automatically holds it in a perfectly balanced position for *all pressures.* No springs or other contrivances are necessary, eliminating unusual wear and maintaining absolute simplicity.

Valve rings assure steam tightness over a long period of years. The removable valve chamber bushing makes it unnecessary ever to re-bore the steam chest and guarantees permanent maximum economy.

See following issues for detailed descriptions of other distinctive features. Catalog No. 105 shows them all. It will be interesting and valuable to you.

ENGBERG'S ELECTRIC & MECHANICAL WORKS, 228 Vine Street, St. Joseph, Michigan, U.S.A.

ENGBERG

Engberg THE STANDARD FOR EFFICIENCY-DURABILITY-SERVICE

ENGINES · GENERATING SETS · GENERATORS · MOTORS · SWITCHBOARDS

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He also became identified with and a heavy stockholder in the reorganized Goodrich Transit Co. and was first vice president of the combination with the Graham & Morton Co. An inventor of many devices in the field of marine engineering, after his retirement from active operations he served as a consulting engineer up to the time of his death.

ELIAS E. GUNNELL

Thomas Durkin

The following brief sketch of the career of Thomas Durkin, for many years fleet engineer of the Cleveland Cliffs Iron Co., will appear in the 1925 transactions of the Society of Naval Architects and Marine Engineers:

Thomas Durkin was born in Ireland, Dec. 15, 1860. He received his early education in schools there and came to America in 1882. He served his apprenticeship in the Samuel Hodge Engine Works, Detroit, and the Detroit Dry Dock of Detroit, Mich. and took a night course in mechanical drafting and marine engineering. He sailed on the Great Lakes and was chief engineer on Great Lakes vessels and in the year 1899 entered the employ of the Cleveland Cliffs Iron Co. as chief engineer of one of its vessels. He supervised the construction of all the large vessels of the company and as chief engineer brought them out on their maiden trips. In the year 1906 he was appointed fleet engineer for the Cleveland Cliffs Iron Co., a position he held until his death. He became a member of the Society in 1922 and he died July 29, 1925.

Thomas Durkin was succeeded in the position as fleet engineer by his son James H. Durkin.

Mail Contracts Awarded to American Ships

The postmaster general and the shipping board have approved contracts for the carrying of the mails awarded to the Munson Steamship line for its service between New York and South America, and to the Export Steamship Corp. for its services between North Atlantic ports and Mediterranean and Black sea ports.

Under the contract with the Munson line, the government will pay at the rate of $3 for each outward mile. Under the contract with the Export line, approximately $100,000 annually will be paid by the government. It is estimated the Munson line may derive about $500,000 a year in revenue from the contract. Both of these lines have been carrying a substantial part to the localities now served by their services.

This is a constructive and helpful step in the aid of an American merchant marine. Further extension of the mail contracts would be a practical encouragement to American steamship companies to meet stiff foreign competition. It is expected that additional privately owned lines may apply for mail contracts now.

It is announced that the shipping board has decided to defer action for a period of three months with reference to the proposed sale of the American Scantic line, operated by Moore & McCormack Co., Inc., between north Atlantic ports and Scandinavian and Baltic ports. The reason given was that the board wished to find out what might be done toward building up the trade of the service before asking for offers for the line.

Capt. Thomas J.A. Johnson Dies at 72

Capt. Thomas J. A. Johnson, 72, known not only on the Great Lakes but on salt water as well for his expert knowledge of salvage work, died in Cleveland on March 11. He never regained his strength from a major operation which he underwent two years ago. Every Great Lakes' skipper and engineer knew Captain Johnson and many of them had experienced his help in times of trouble. He was born in La Salle, Ill., and got a job with the Dunham Towing & Wrecking Co. of Chicago, at the age of 12.

He was a chief engineer at the age of 21 and became recognized for his expertness as a diver. When the Dunham Co. became a part of the Great Lakes Towing Co. in 1906, Captain Johnson was elected vice president and moved from Chicago to Cleveland, where he had since resided.

It was said that he gained international fame through the construction of the wrecking steamer FAVORITE II. This steamer was the first complete wrecking vessel to be built and had the cranes, rigging and tools and complete diver's equipment as well as boiler and machine shops, for doing any kind of a salvage job. The FAVORITE II was requisitioned by the United States government during the World war and is now doing duty at Panama. In latter years Captain Johnson has had charge of construction and operation of about 90 boats of the Great Lakes company.

New Floating Dry Dock for Montevideo

A new floating dry dock, will be placed in operation in the harbor of Montevideo, about May of 1926, according to consular advices to the department of commerce.

The dry dock has been purchased in Hamburg, Germany, where it was built in February of 1925, and will be towed to Montevideo at an early date.

The following description of this dock has been published for the information of shipping interests: Length 80 meters, exterior width 23 meters, capacity for vessels of 4500 to 5000 tons displacement, has proper groups of generators with two 100 horsepower diesel engines, has two centrifugal pumps of vertical axis that can make the dock dry in one hour, has two electric capstans, and has drafting room and other modern facilities.

Alexander Carlisle noted British engineer long associated with Harland & Wolff and designer of the TITANIC and other great ocean liners died at London on March 5, at the age of 72. He was once managing director of Harland & Wolff and it is said that the TITANIC tragedy broke his heart.

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Waterway Is Wasted

(*Continued from Page* 66)

vania are the centers of the iron and steel industry of the United States. This industry has developed largely because of facilities for transportation. The ore of Lake Superior and the coal of Ohio, West Virginia and Pennsylvania must meet somewhere, if industry is to live.

Industry Depends on Transportation

The Great Lakes freighter has developed the cheapest and most efficient system of transportation in the world. This transportation is cheap and efficient only when vessel captains are enabled to load their ships to the economic maximum; if they can take on only one-half or two-thirds of a cargo, overhead expenses remaining the same, it must be perfectly evident that freight rates on ore will increase to the prohibitive point. If this unfortunate time should ever come, the iron and steel business that has been built up in eastern Ohio and western Pennsylvania will be transferred to some other point. Indeed, one can scarcely escape the thought that there is method in the madness of some persons who are advocating the continued diversion of water at Chicago.

Lake Michigan is deeper than Lake Erie and would not be so unfavorably affected by lowering of lake levels. All of this might mean that some of these gentlemen have in their mind the idea that the iron and steel business should be moved from the Mahoning and Mononogahela valleys to some point around Lake Michigan. Anyhow, why are the people who chance to live in the Chicago district to be permitted to enjoy an advantage which the people in no other lake city can enjoy?

Why should they be permitted to imperil the health and threaten the industrial life of everybody in the Great Lakes basin, in order that Chicago and its environs should have a cheap method of disposing of its sewage? Shorn of all its verbiage—that is exactly what the proposition means. It is nonsense to claim that a diversion of 10,000 cubic feet per second is necessary for navigation purposes through the drainage canal. So far as I know, there will be no serious objection to such diversion as is necessary for the interests of navigation. All engineers agree that 1000 cubic feet per second is an abundence to take care of navigation in the drainage canal. Why then is it insisted that the diversion shall amount to 10,000 cubic feet? The answer must be perfectly evident. It is only for the purpose of creating in the drainage canal a swift current that will dispose of Chicago's sewage and enable Chicago to develop power at Lockport.

The people of the United States have the idea that the water power of the country belongs to the people and not to any particular city that may happen to grab it. The whole country is interested, and properly so, in the development of navigation of our internal waterways. It is most unfortunate, however, that the Mississippi Valley association in its recent meeting at St. Louis, committed itself to the defense of Chicago's claim for 10,000 cubic feet per second through the drainage canal. All that navigation needs is 1000 cubic feet per second. Why should those interested in waterways seek to strengthen the waning cause of drainage canal advocates by making the absurd claim that 10,000 cubic feet is necessary, particularly when this claim is in flat contradiction of information that can be furnished by any engineer acquainted with the situation.

While thinking of developing navigation we must not lose sight of the fact that already there exists upon the Great Lakes that which was heretofore pointed out—the greatest system of cheap transportation in the world. What folly to destroy this system in order to experiment with the development of another! By no stretch of imagination could the traffic going through the Chicago drainage canal approach that which now goes through the Detroit river. I am one of those strongly in favor of the development of inland waterways, but with such vigor as I may possess, I shall actively oppose any such plan as that advocated by the Mississippi Valley association in its claim for the diversion of 10,000 cubic feet per second.

International comity, engineering facts, and a sense of decency and fair play demand that at the earliest possible moment the diversion of water from Lake Michigan through the drainage canal shall be brought down to the minimum required for navigation purposes through that canal.

It should further be noted that if water power development is to be considered; vastly more power can be developed in the Niagara Falls region than at Lockport. The plan proposed by the drainage canal advocates means a loss in hydro-electric power develpoment of more than 400,000 horsepower. The latest reports show that Lakes Michigan and Huron were 1.09 feet lower last December than the low stage of a year ago, which was 2.3 feet below the normal for ten years. Lake Erie is 1.3 feet below the average of November stage for the last ten years.

If this illegal uneconomic and selfish policy is to be continued, the industrial life of a great section of our country is seriously imperiled and millions of people are subjected to a burden in order that a relatively few in and about Chicago may enjoy advantages not vouchsafed to them by nature, nor warranted by any law.

Capt. Fried's Reception

The Neptune association should be given credit for a large share in initiating the well deserved reception given to Captain Fried and his men when they returned after their brilliant performance in rescuing all the crew of the British freighter ANTINOE. The plans formulated by Captain Milliken, secretary-treasurer of the association, were adopted practically without change by the mayor's committee.

Never before in the history of the United States has a merchant officer and his crew been received with such distinction as was accorded the captain and men of the ROOSEVELT. Such recognition will help to stimulate among Americans a stronger feeling for the sea and matters pertaining to it.

February Lake Levels

The United States Lake survey reports the monthly mean stages of the Great Lakes for the month of February as follows:

Lakes	Feet above mean sea level
Superior	600.20
Michigan-Huron	577.43
St. Clair	571.66
Erie	569.93
Ontario	244.10

Lake Superior is 0.29 foot lower than in January and it is 0.69 foot lower than the February stage of a year ago. Lakes Michigan-Huron are 0.05 foot higher than in January and they are 0.75 foot lower than the low February stage of a year ago. Lake Erie is 0.11 foot lower than in January and it is 0.57 foot lower than the low February stage of a year ago. Lake Ontario is 0.18 foot lower than in January and it is 0.31 foot lower than the February stage of a year ago, 1.03 feet below the average stage of February of the last ten years.

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Modern Pier Pays

(*Continued from Page* 69)

west side of 39 feet at mean low water.

Some idea of the operation of the pier may be gained from a detailed case. Recently the WEST GOTOMSKA arrived from Finland. A report by cable on the probable date of arrival and the nature of the cargo was received by a broker in Portland, who immediately got in touch with the pier manager, George F. Feeney. The date was entered and a berth on the east side of the pier was allotted. The principal cargo was wood pulp. Three days before the vessel arrived, a wireless message gave a corrected due date, and as soon as this was received, Mr. Feeney called for bids for discharging the pulp.

Stevedoring Charges Are Reasonable

There are four or more independent stevedore companies in Portland who bid on loading and unloading. The men work under a fair but definite agreement, and the prices for discharging of wood pulp range from 65 cents to 80 cents a ton depending upon the conditions at the port. If it is necessary for any reason to rush the unloading, to make room for some waiting vessel for instance, a new and advanced unloading rate which covers a certain amount of overtime is put in effect. The increased tonnage of shipping at Portland, which has resulted from the operation of the new state pier, has of course given increased work to the port stevedores. An increased number of arrivals has made for greater uniformity in stevedore employment. Idle time has been reduced and this, of course, creates better working conditions and makes for fair rates.

Having secured a satisfactory bid for discharging the WEST GOTOMSKA cargo, Mr. Feeney entered into a definite contract in which the detailed items of berth, cargo, time of unloading and disposition of goods were covered. While the probable time of arrival of the vessel was stated, a leeway of 48 hours was allowed the pier company under the contract terms. The usual form of contract drawn up between the stevedore companies and the pier stipulates the scheme of checking, the equipment which is to be used, and other similar items. Of course, all these conditions are well known to the stevedore companies, each of which has unloaded many vessels at the pier.

The WEST GOTOMSKA arrived very nearly on schedule. A wireless message in the evening gave the probable hour as ten the next morning, and a telegave the report that she had been sighted. No matter how frequent the arrival of a ship, there is always a little excitement—a little feeling of romance as a boat from the distant land warps up to a pier. The stevedores were on hand in force as the GOTOMSKA was made fast, and before the passengers were off, hatch covers had been lifted and the systematic unloading of pulp had started.

The pier has special accommodation for passengers, and has encouraged this branch of activity as a means of giving greater publicity to the Port of Portland, and also for the additional income. The vessels are charged 25 cents for each passenger, and because of the absence of congestion, the treatment of passengers arriving at Portland is better than that at larger ports.

How Cargo Is Handled

With the exception of a tallyman furnished by the pier company, the stevedore companies furnish all labor for unloading. Men are furnished to operate the ship's winches and all of the pier equipment which is used in the actual unloading. Pulp from Finland arrives in bales approximately 3 x 2 x 2 feet in dimensions weighing a little under 500 pounds each. These are moved in the hold by hand trucks. The stevedores are divided into gangs, 16 to each gang, and one gang to each hatchway. The usual vessel carrying bale pulp has two winches to each hatch. When this is the case the bales are merely hand trucked to a point directly below the hatch where they are dumped onto rope slings which are quickly fastened to the winch falls. The bales are then hoisted up out of the hold and with the aid of the other boom and winch swung over onto the pier deck. Here the disposition varies according to the pulp's destination. The WEST GOTOMSKA had several consignees for its pulp. As a result part of the bales were hand trucked to a convenient place for motor trucks to pick them up for local delivery. Other bales were loaded direct into waiting freight cars and still others were stored because instructions from consignee had not been received.

A Port Seeks Revenue

One of the difficult problems for any pier company is the development of business that will bring adequate revenue. If the charges are too high, not only the pier, but often the entire port suffers. The business of shipping by water differs from most enterprises. The headquarters of the shipping company is frequently thousands of miles distant, and negotiations are carried on through a port representative or agent. The vessel captain has some influence in determining the port of arrival. In the case of smaller foreign tramps he is frequently a stockholder, and in any case, if he meets with burdensome charges and regulations at a port, the shipping company would be inclined to act on his suggestion to use some other port. However, the pier, whether privately or publicly owned, must show a profit in its operation in order to be successful, and a reasonable revenue must, therefore, be obtained. In some cases harbor dues are charged. This is a fee placed on all vessels entering the port, and is usually based on the tonnage of the vessel. This method of securing revenue has been exceedingly unpopular, and is rapidly being discarded. Today only two ports of importance in this country cling to the harbor dues assessment.

Another method of assessment is called dockage. This is a charge against the vessel for the use of facilities furnished by the port. It is most frequently used if a ship is lying idle or undergoing repairs. In many cases no dockage charge is made if the vessel is loading or discharging cargo at a normal rate. New York has a dockage charge ranging from 1¾ cents to 2½ cents per ton depending on conditions.

Wharfage Charge Works Well

The most popular means of revenue is known as wharfage. This is a charge against goods passing over the wharves, usually on a tonnage basis, although in some cases on a cubic foot basis. Different commodities frequently carry different rates. An average charge is about 20 cents per ton. Railroads have adopted many through rates which absorb the wharfage charge. At Portland the railroads absorb the wharfage charge where the minimum line haul gives a freight earning of 8 cents per hundred pounds or more. The pier, however, secures a revenue based on a sliding scale ranging from 30 to 50 cents a ton. In the case of through rates this is billed against the railroad. Wherever freight is delivered locally, a wharfage charge of 50 cents per net ton is made against the shipping company.

Another source of revenue is rental. Designated berths are rented at so much a day for almost any service desired, such as refitting a vessel, handling passenger trade, taking on fuel and lying idle. In looking around for additional revenue, for the Portland pier, negotiations were made

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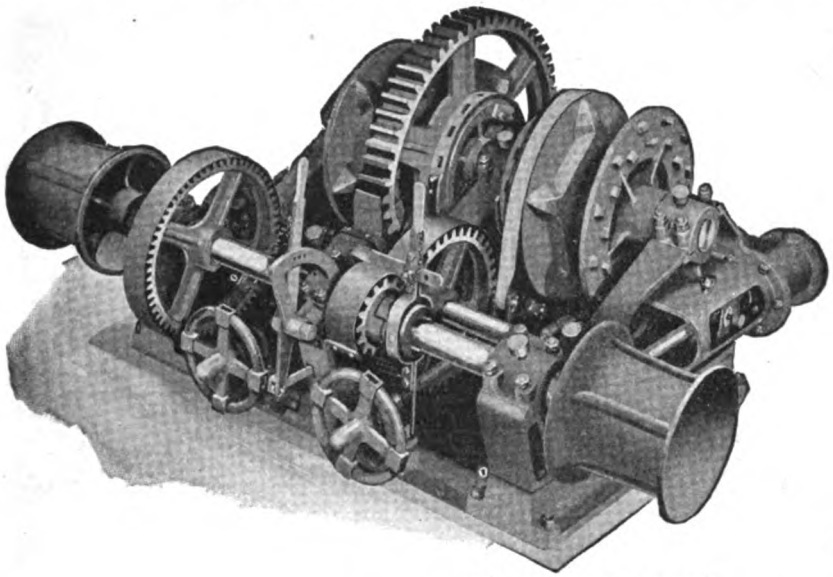

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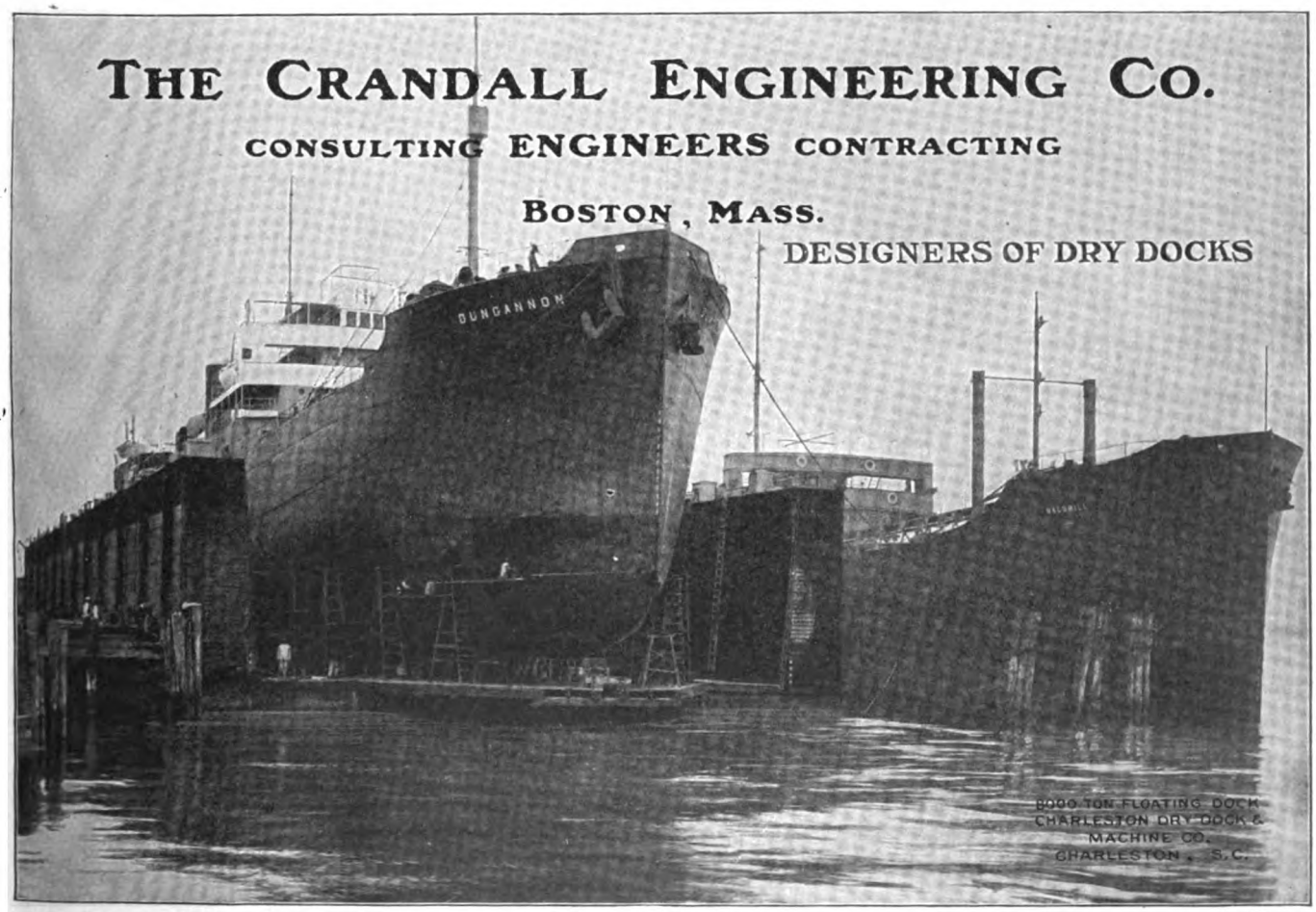

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with the Eastern Steamship lines resulting in a ten year lease of part of the west side of the pier. Another source of revenue which is gradually being developed at Portland, and which is one of the important items at state owned piers at other ports, is storage. The Portland pier is equipped with two commodious steel sheds, and the use of space in these sheds by business houses is being encouraged.

Pier Facilities Help Business

One of the chief duties of a state pier is the co-ordination and adjustment of water and land traffic. Increased vessel cargo handled at a pier always carries with it increased rail traffic. This feature was recently pointed out by Henry F. Merrill in an address before railway officials at Portland, He said there was at first some apprehension on the part of railroads that development of Maine's port and of coastwise traffic would tend to lessen rail traffic. A little study of the situation soon showed that the opposite was the case, however. If water traffic is the natural logical means of transporting goods, its use will react to the benefit of all. The producer will be able to produce more. The territory will develop and with it will come a definite development of rail tonnage.

The state of Maine has recently been carrying on an extensive program of port development, and the railroads have heartily co-operated in this movement. They have been convinced that encouragement to Maine's industries is of prime importance and in consequence they have met nearly all requests made by the state pier at Portland for freight absorption.

Developing New Business

Having established some fair working methods of securing revenue from commodity tonnage handled at the pier, the next step in the business development of the pier's operation was that of increasing the tonnage. A little study developed the fact that Pacific markets were open to Maine's industries. Shoes, for instance, manufactured in Auburn, Me., can be delivered at San Francisco at a lower transportation charge than can shoes manufactured in St. Louis. The same thing is true of paper and of many other commodities. With the backing of the state pier and influential men in Portland, a regular Pacific coast service out of Portland was established, and is now proving a profitable venture not only to the pier, but to the state industries and the shipping company as well.

So closely is a state pier allied with the state's activity, that the business manager of such a pier becomes in a sense a promotor of state enterprise generally. He is anxious to have agriculture throughout the state improved so that the tonnage of food stuffs handled over his pier will increase. Portland is a large canning center, and a heavy percentage of the canned products are shipped by water. The state pier is thus offering every possible encouragement to the canning industry, and back of this to the farmers and fruit growers throughout the state of Maine. It is from this angle as much as any other that a state pier becomes a state asset. Whenever you can introduce an enterprise which requires for its success the increased industrial and agricultural activity of a community, you most certainly have helped that community.

Port Development An Asset

The state of Maine has more good ports than any other state, and one line of activity of the Portland pier lies therefore in the development of coastwise traffic with these ports. Backed by the pier directors, and with the hearty co-operation of state officers from the governor down, Maine's water commerce is being improved. Eastern Maine points which heretofore could not raise crops profitably for shipment to market over rails, are now meeting with success in marketing agricultural products by water shipment to Portland.

Portland is fortunate in having a belt railway connecting all railroads, and also connecting all piers. This belt line is operated jointly by several of the roads and affords industries located at any point opportunity for shipping by any of the roads or over any of the principal wharves without switching charge.

The mean range of tide at the port is 8.9 feet. The depth at mean low water is 30 feet, and the state pier is three miles from the open ocean.

Beats Previous Records

February traffic through the Panama canal was greater than in any previous February since the construction of the waterway, the war department has been advised in a report from the governor of the Canal zone.

A total of 424 commercial vessels and 12 small launches passed through the canal during the month, paying tolls amounting to $1,825,299. The previous high mark for that month was reached in February, 1924, when 418 vessels transited the canal.

As Advisory Engineer

Rear Admiral Charles W. Dyson, U. S. N. retired, has become associated with J. Barraja-Frauenfelder & Co. in the capacity of senior advisory engineer.

All matters pertaining to powering of ships, including propeller designs, general power installations and all investigations involving power problems, will be subject to Admiral Dyson's final approval. This company is to be congratulated upon the addition of so well known an engineer to their staff.

Rebuild Allouez Ore Dock

The reconstructed ore dock of the Great Northern railway at Allouez, Wis., consists of 124 pockets of the latest type and is electrically operated. These pockets have a total capacity of 43,400 tons. It is expected that an additional 124 pockets will be added to this dock and plans have been approved for this work. They will not be completed however, until next year.

Largest Lake Freighter

The largest freight steamer on the Great Lakes, the GLENMOHR which is being built by the Midland Shipbuilding Co., Midland, Ont., for interests represented by Sir James Playfair, will be launched about the middle of July. The GLENMOHR is 633 feet long, 70 feet wide and 29 feet in molded depth. This vessel will probably go over in the consolidation of the Sir James Playfair interests with the Canada Steamship Co. This merger which has been reported, will give the Canadians the largest fleet on the Great Lakes, approximately 119 vessels all told or 19 more than the American fleet of the Pittsburgh Steamship Co. now the largest vessel owner on the Great Lakes. Little effect is expected from the merger as far as American vessels or trades are concerned. It will however, reduce Canadian competition to a minimum as it will leave only one other Canadian operator of any size.

The American Hoist & Derrick Co., which has its works and main offices at St. Paul, Minn., has recently opened another branch office at 1943 Railway Exchange building, St. Louis, Mo., with Mr. Ward B. Maurer in charge.

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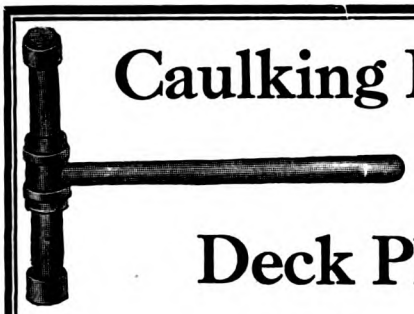

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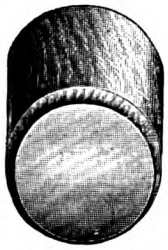

Apparently trifling items in Marine Hardware are as carefully stocked as more expensive ones. For instance, in Deck Plugs we carry eleven different sizes in twelve different kinds of wood, from 5/16" to 1½". Likewise in Caulking Mallets, we have nine different sizes and kinds.

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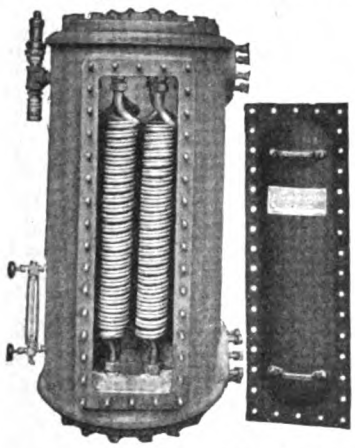
Look into the Reilly Heater



Note how little space it occupies; how easily inspected; how each coil is shaped like a spring, preventing expansion strains on the joint.

There are many other advantages of the Reilly Heater that you will be interested in reading about. Bulletin 511 tells the story. Send for a copy.

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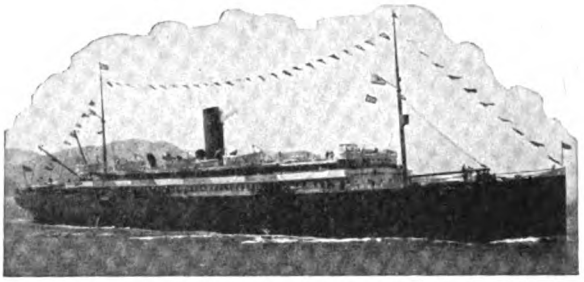

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Double Acting Diesel

(*Continued from Page 67*)

board conversion program. The engine met its specifications and in many respects showed remarkable performance. The endurance run started Feb. 2, and the engine was operated at loads around 2900 brake horsepower at 95 revolutions per minute, until March 4. At the end of this period, without stopping, the load was increased ten per cent for a period of six hours, then for a further period of four hours the speed was increased another five per cent, making an overload of speed and work. Those present stated that this overload at the end of the long hard run was a most unusual test for any piece of machinery. The engine was remarkable for its smooth quiet running.

Is Easy To Maneuver

Immediately following the endurance run the most interesting and spectacular experiments were carried out, the engine being maneuvered by different members of the inspection party. One of the men who had long experience with steam engines remarked on its easy handling. One of the maneuvers which, in the past, has been at times a difficult problem for diesel engines, was reversing. The double-acting two-cycle principle makes for simplification in reversing and the engine reversed it was said more easily than a steam engine. Complete reversal from full load in one direction to full load in the opposite direction was made in six seconds, then twenty-eight consecutive reversals were made at an average time of eight and one-half seconds each. Forty reversals were made in one hour.

Incidental to the test a noteworthy performance was carried out in starting up after shut down. The engine had been shut down for seventeen hours, and was started up instantly without even priming the fuel valves. As diesel engines are started and reversed with compressed air, one of the tests that must be met is the number of reversals that can be made with the compressed air in the maneuvering tank. Forty-seven reversals were made without drawing air from outside the standard equipment. More could have been made, but the requirements were so far exceeded that it was not considered necessary to go farther.

Fuel Consumption Measured

Among the records kept during the endurance run, was, of course, the regular measurement of fuel. The results showed that the fuel consumption was about fourteen tons per twenty-four hours. The fuel used was an asphalt base burner oil of high viscosity, which had to be heated before it would flow into the fuel piping system. The fuel consumption of the oil burning steamer would be approximately thirty-five tons against fourteen which is a saving of about twenty-one tons of oil per day. Definite test data will be available as soon as it is released by the shipping board. Among the engineers present at the completion of the test were W. W. Smith, Federal Ship Building Co.; J. O. Arkabauer, of Phelps Brothers Co.; representatives of the Cosulich Line; E. Delbose and J. F. Fox of the Brooklyn navy yard; A. R. Gatewood of the Standard Oil Co. of New Jersey and A. Neveling of the Great Lakes Dock & Dredge Co.

Construction was begun in 1921 on an experimental horizontal engine having a single cylinder, 14 inches in diameter by 19 inches stroke. This cylinder was designed to operate at 150 revolutions per minute but after the initial tests the engine speed was raised to 200 revolutions per minute in order to study the processes of combustion and scavenging as well as the effects on the combustion space, piston rod, and packing, of piston speeds approximating that of the larger engines to be built.

Six Years of Development

The data gained from the exhaustive tests on the experimental unit permitted the design and construction to proceed so evenly that a vertical engine with a single cylinder 27 inches bore by 40 inches stroke was under full load within one month of its initial start in June, 1924. This engine was subjected to severe tests, and to demonstrate the soundness of the design a 30-day non-stop run was made in September, 1924 under the supervision of the United States shipping board engineers. The results of this test as reported by Oscar Olson, senior shipping board inspector demonstrated the reliability of this type of engine and was entirely satisfactory.

The engines now building for the shipping board and private interests have four cylinders 28 inches diameter by 40 inches stroke, and when operating at a speed of 95 revolutions per minute have a rated output of 2900 brake horsepower delivered at the shaft coupling. One of these engines is shown in Fig. 2 while Fig. 1 is a cross section through the cylinder and its supporting frame.

The center block of each cylinder is supported on a distance piece or box resting on independent cast-iron box frames, which in turn rest on the engine bed plate. Each frame is flanged to the adjoining frame so as to form a common crank case for the power cylinders and compressors. These frames however are only tied in on the bottom permitting easy expansion of each vertical element. A marine engine, obviously, can be made so rigid as to cause a bed-plate fracture due to its failure to accommodate itself to the slight deflection of the vessel.

The cylinders are held to the bed plate by means of four tie-rods placed at each corner of the cylinder center block and passing through the distance piece, the frame members and the bed plate. These rods take up all the tension stress resulting from combustion in the upper ends of the cylinders. The pressure developed in the lower cylinder ends sets up only compressive stresses in the frame for which the cast-iron members are well suited.

The frames carry the support for the crosshead guides, which are of the flat water-cooled type. Astern bars are also provided to support the crosshead shoes when the engines are running astern. The crankshaft is built up of sections and is drilled to provide the supply of lubrication to the journals, crankpins, and crosshead pins under pressure. Forced lubrication is also applied to the crosshead shoes and to the piston-rod stuffing box. The bearings are babbitted steel shells and are easily removed by rolling after being relieved of the weight of the shaft.

As in all two-cycle engines a scavenging pump is a necessary part of the unit. After due study the reciprocating type of pump was adopted inasmuch as its power requirements are less than those of a turbo-blower.

Has Good Efficiency

The thermal efficiency; that is, the percentage of the energy in the fuel oil converted into effective work is as high as met with in the four-cycle single-acting engine. The fact that the exhaust port is uncovered when the piston has about 10 per cent of its stroke to complete together with the belief that the clearing of the cylinder of the burnt gases by scavenging is faulty, is the basis of the common idea that the power per cubic foot of piston displacement and the efficiency are less with the two-cycle. That this is erroneous may be demonstrated by tests. It is true that for a given consumption of fuel the early release of gases through the exhaust

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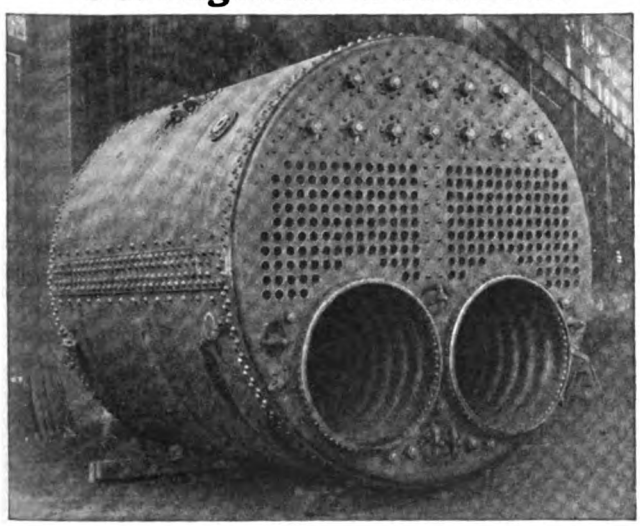

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ports causes a decrease in the indicated horsepower. However, it is net or shaft horsepower that the user is interested in, and this in the double-acting two-cycle is equal, if not superior to that of the four-cycle single-acting type. The reason is found in the fact that during the four-cycle suction and exhaust strokes power is consumed in overcoming friction.

Inasmuch as the power consumed by the scavenging pump is less than 4 per cent of the engine's output, and the power lost by early exhaust is about 5 per cent, it requires no argument to prove that the net power per unit of piston displacement obtained in the double-acting two-cycle engine is equal to that of the four-cycle. On the basis of net thermal efficiency the two engines are on approximate parity.

As pointed out early in this discussion the advantage of the double-acting engine lies in its decreased weight and more compact design. The tabulation given below, of the shipping board bids are illuminating on these details:

Bids On Shipping Board Engines

	Ind. M.E.P.	Piston speed	Number of cylinders	Comparative price per B.P.H.	Comparative weight per B.P.H.
S.A.F.C.	94.5	920	8	100	100
S.A.T.C.	88.7	827	6	85	97
D.A.F.C.	86.0	830	4	79	90
D.A.T.C.	79.5	660	4	60	61

Note—S.A.F.C.—Single acting 4-cycle; S.A.T.C.—single acting 2-cycle D.A.F.C.—double acting 4-cycle; D.A.T.C.—double acting 2-cycle.

It will be noticed that the double-acting two-cycle Worthington engine weighs only 61 per cent of the weight of the single-acting four-cycle engines, and, if the former's piston speed be raised to that of the latter, the double-acting unit would weigh only 44 per cent as heavy as the four-cycle, single-acting unit. Comparison between the bids on the double-acting four-cycle and single-acting two-cycle shows the superiority possessed by the double-acting two-cycle diesel.

Of equal value is the simplicity of valve gearing. With all exhaust valves, admission valves, and attendant cams, push rods, rocker arms, springs and cages eliminated a considerable amount of the maintenance work of the engine is avoided. This not only reduces the cost of parts but, of greater importance, no maintenance crew is needed.

The design at present is confined to two sizes, i. e., 28 x 40 and 16 x 24, the latter rated at 250 brake horsepower per cylinder at 180 revolutions per minute. Another line of 34 inches bore by 48 inches stroke is contemplated which at 110 revolutions per minute will develop 1500 brake horsepower per cylinder. This means that singlescrew motorships of as high as 12,000 brake horsepower are feasible.

Error Is Corrected

In the February issue of MARINE REVIEW a schedule of drydocking charges was given for the old Esquimalt drydock British Columbia which we are informed by. J. P. Forde, district engineer for the department of public works, Canada, in charge, is incorrect.

It is a pleasure to publish the correct charges furnished by Mr. Forde as follows:

All vessels above 2000 tons—first day of docking $400.00, following days, 4 cents per ton up to 2000 tons and 2 cents per ton on all tonnage above 2000 tons. All charges are based on gross tonnage of vessel and cargo.

American Oakum

In establishing the reputation and prestige of American oakum, as made by the George Stratford Oakum Co. a concern established for nearly 100 years, the manufacturer has accomplished a difficult task in securing world-wide acknowledgment of quality. But so well has this been done that the product of this company may now be found in every port of the world, in every shipyard, drydock, and repair yard.

New Work Is Pending

An inquiry has come out for a 250-foot combination passenger and freight boat for the Pacific coast. Albert Lawson is the architect. There are rumors that the Hudson River Day Line may build another boat, that the Clyde line is going to come out with two more boats and that a vessel will be placed soon for the New York and Porto Rico service.

The Long Island railroad has placed an order with the Staten Island Shipbuilding Corp. for a diesel driven tugboat.

The New Haven railroad is in the market for two carfloats. The United States Gypsum Co. has not yet taken any action, apparently, on its inquiry for two 360-foot freighters.

The Diamond Power Speciality Corp., Detroit, announces the appointment of Mr. M. J. Miller as sales engineer in charge of the Detroit district. Mr. J. E. Heeter succeeds Mr. M. J. Miller as manager of the Philadelphia office.

Shipbuilding Improves

(*Continued from Page* 13)

motor propeller drives. Of these a large self unloading lake freighter represents the most radical and progressive departure from customary practice. Electrical power in large amount necessary for driving the unloading machinery (so that the main unit may be operated for this purpose) was undoubterly an important factor in the choice in this case. Two rather exceptionally fine ferries for service in San Francisco bay are to be equipped with turbo-electric drive, because of the successful results obtained with other recent installations. Especial interest however centers in the adoption of turbo-electric drive for the splendid fore runner of a fine fleet of American ocean going passenger ships, ordered for the New York—Panama—San Francisco service. Electric drive has become the standard in the navy and has been brought to a high point of efficiency but this is by far the largest merchant ship installation yet attempted.

The table on page 13 has been prepared to show clearly and concisely the type, service, propulsive machinery and fuel of the entire 107 steel powered merchant vessels over 100 gross tons, completed under construction or contracted for in American shipyards from Jan. 1, 1925 to Jan. 1, 1926. Fairly broad though well defined classifications have been chosen and are noted in the space headed "types." The next column carries the number of vessels in each classification. This number is in turn split up into the respective kinds of propulsive power installed. Abbreviations at the head of each column reading from left to right stand for the following: steam reciprocating engines with coal burning boilers; the same with oil burning boilers; steam turbines and reduction gears with oil burning boilers; diesel-electric with electric motors direct connected; turbine-electric with boilers burning oil; and turbine-electric with boilers burning coal.

It is interesting to note that of the 14 large passenger vessels listed 13 are fitted with turbines and reduction gears. No ocean or coastwise passenger ship and only one small ocean freighter is fitted with diesel engines. However two large ocean tankers are both diesel driven. Three Great Lakes freighters (two are smaller vessels under construction in an Atlantic coast shipyard) are fitted with diesels, diesel-electric and turbine-electric.

Shipbuilding is slowly improving.

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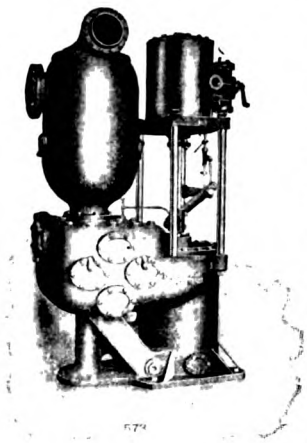

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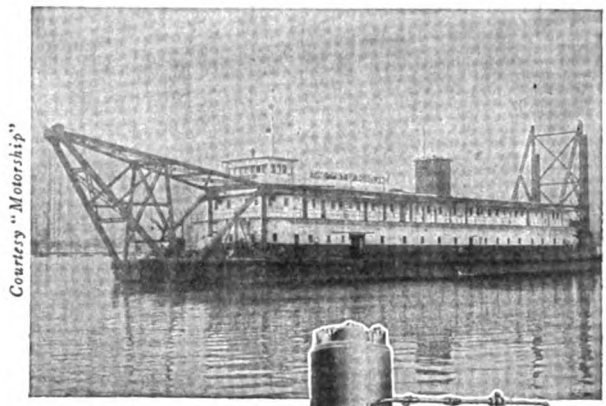
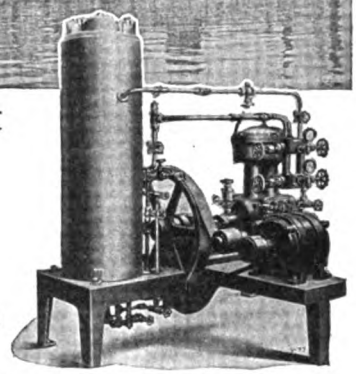


Courtesy "Motorship"

Port of Portland's Diesel-electric Dredge "Clackamas."



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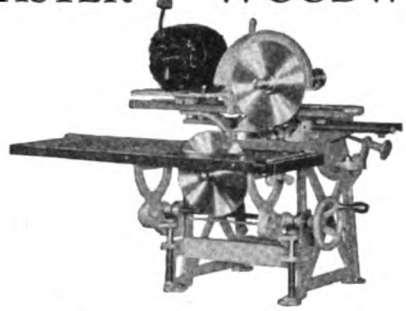

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Multiple Launching

(*Continued from Page* 65)

with Miss Patty Burke as sponsor. This yacht is 140 feet in overall length, to be powered by twin-screw diesel engines of 550 horsepower, giving a speed of 12½ knots, with a cruising radius of 5000 miles. The deck house will contain dining-room, pantry and galley forward and, at the after end, the library finished in walnut, and the living-room in panelled teak. Quarters for the owner comprises five staterooms each with bath. Cox & Stevens are the architects.

ARAS—A yacht for Hugh J. Chisholm, New York and Portland, Me., with Mrs. Hugh J. Chisholm as sponsor. This is a yacht with 162 feet 3 inches overall length, to be powered with twin diesel engines of 950 horsepower, giving a speed of 14 knots, with a cruising radius of 5500 miles. The deckhouse will house the dining-room, finished in walnut, the lounge and a bright, cheery childrens' room. The five staterooms, each with bath, are on the boat deck. An interesting feature is the double bottom, which is an unusual protection for a vessel of this type.

Three house barges—for the Chesapeake & Ohio railway. These are of all-steel constuction. In each case the end and bottom were fabricated in the usual shipbuilding fashion, while the sides were assembled as complete units and then lowered into place for final riveting-up. The barges are identical, with overall length of 100 feet and beam of 30 feet, each 500 tons capacity.

One car float—for the Chesapeake & Ohio railway. This has an overall length of 256 feet, beam of 36 feet and has capacity for 12 standard railway cars.

End Launchings on Ways

Ships which were launched by the old-fashioned method included the following:

DORCHESTER—A combination freight and passenger vessel for the Merchants & Miners Transportation Co. the sponsor being Miss Louise Brooks. She has an overall length of 368 feet and 52-foot beam, and is an oil burner, powered by a triple expansion steam engine, direct connected to a single screw, driving the ship at a speed of 12 knots. The cabin accommodations are designed for the Florida traffic. The architecture is the work of Mr. A. D. Stebbins, president of the Merchants & Miners Transportation Co. and the officers of that company.

RAYMOND—A dredge for the United States war department, and sponsored by Miss Caroline Raymond, granddaughter of General Raymond, after whom the dredge has been named. Miss Raymond is the daughter of Col. R. R. Raymond, United States army, retired. This dredge has an overall length of 228 feet, with 40-foot beam and total depth of 14 feet 8 inches. The suction dredging pump is driven by a diesel engine capable of developing 1100 brake horsepower. Two other diesel engines of 850 brake horsepower each will drive the main electric generators which will supply power for the many motors required as well as current for the ships lights, including the powerful lights used in night dredging.

New Keels Laid

One of the keels laid on March 20, alluded to above, is for a combination freight and passenger vessel for the Panama Pacific service of the International Mercantile Marine Co. She will be of most modern type throughout and will be 601 feet 3 inches in overall length, 80-foot beam and will have a speed of 17 knots. Oil burning boilers will furnish steam to 18,000-horsepower, turbine-driven, electric generators, which in turn will drive electric motors direct-connected to twin screws. Of 31,000 tons displacement, accommodations are provided for 362 first class passengers and 368 tourist passengers. The vessel is being built under the personal supervision of Capt. Rorger Williams, manager of operation of the International Mercantile Marine Co. and is expected to go into service in the early summer of 1927. She will be fitted with spacious refrigerators for carrying California fresh fruits and will have ventilating holds with a total capacity of 7800 tons of freight. Novel features of the vessel will embrace large side ports through which automobiles carried by passengers as baggage can be driven on board; staterooms all of the outside type in both classes; private baths for all the principal first class staterooms and deck spaces for promenading and sports exceeding in breadth those on big transatlantic liners.

Keels for two steamers for the Clyde Line also were laid at the yard on March 20. One will be 407 feet 3 inches in overall length, with 62-foot beam and accommodations for 930 passengers. The steam plant will be oil-burning boilers and with 8500-horsepower in geared turbine driving twin screws. The other will have overall length of 402 feet, beam of 54 feet and with accommodations for 449 passengers. The steam plant will be oil burning with turbines of 4200 horsepower geared to a single screw. Theodore E. Ferris is the designer. These keels are included in the Clyde Line 1926 construction program, which comprises the building of five ships for the Florida service.

Program Carried Through on Time

The precision with which the great program was executed called forth much admiration. The prepared timetable called for the start of flooding the submerged ways at 11.30 in the forenoon, and the final launching at 2.45 in the afternoon. There were no delays at any point in the schedule.

It may be said that launching by the float method is wholly lacking in the great thrill that attends an old-fashioned launching. The ways in which the ships were floated, have concrete walls on each side, with the opening into the river sealed by means of steel caissons. It took a long time for the water to fill this basin sufficiently to float the hulls and there was no great moment other than that in which the sponsors broke bottles of grape juice against their steel sides. It seemed after the launching of the DORCHESTER and the RAYMOND that there are few spectacles that equal that of a big ship going down greased ways into the water, and thus ploughing its pathway into the element in which it thereafter will lead its existance. The old-fashioned launching method seemed to provide a more fitting and vivid climax to the work of many months of planning and building the hull.

Much interest was added to the day's doing at Newport News as a result of the events staged by the United States military forces. There were demonstrations of hydroplanes from Hampton Roads and aerial formations from Langley Field. The Coast Artillery station at Fortress Monroe also staged an anti-aircraft demonstration. Too, detailed report of the events at the shipyard were broad-casted from an army type Martin bomber plane through amplifiers in the shipyard and through station WTAR at Norfolk.

Of course, there was a great deal of human coloring to this affair at Newport News. The community was well organized and thousands of school children, numbering undoubtedly many shipbuilders and shipbuilders' wives of the future, stood in compact groups singing, "Carry me Back to Ole Virginny."

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